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SOME BIRDS FROM SINAI AND PALESTINE.

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Plate XVII.

WE left Suez on March 22, 1914, for a brief trip through the Sinai Peninsula, and then to Jerusalem, via Akaba and the east side of the Dead Sea. Mr. Mann was to pursue insects and reptiles and both of us put in our spare moments chasing birds and trapping mammals. As much of the route lay through a desert, our catch was small, except for the reptiles. Mammals, though in places numerous, were hard to trap and many specimens were stolen by jackals or eaten by ants before daylight, so that we often despaired of bringing back a representative lot.

This journey takes one through several very different types of country. The bare desert around Suez, very similar to the deserts of Egypt; then the rugged Sinai plateau with peaks up to 8500 feet in height; the low deserts around Akaba, with an Arabian and Dead Sea fauna; the bare-wind swept 5000 foot plateau east of the Dead Sea depression; and lastly the oleander and cane jungles of the Dead Sea and its affluents, with a sub-tropical fauna and flora, and an altitude as low as 1300 feet beneath the level of the sea.

When you leave Suez behind, you enter upon the worst stage of the journey. The spring sun is scorching from nine o'clock till four, and the level stretches of gravel and limestone are hardly

relieved by the sight of a single creature, barring lizards and scorpions. At rare intervals an Egyptian Vulture sails overhead or a pair of Ravens follows the caravan for a time. At nightfall one or two White Wagtails gather around the tents and run about under the very feet of the camels.

There are only two spots along this road where birds can really exist. One is the Wells of Moses, eight miles from Suez, and the other is Wady Gharandel, identified with the Elim of the Bible Exodus. At this latter place we arrived on the third day, camping at the upper end of the Wady where there was a well some six feet below the surface of the ground and a number of palms, sayal thorn trees and shrubs of various sorts. Here we got a few birds, a Great Grey Shrike, Wheatears in abundance, Ruppell's and Bonelli's Warblers, Chiff-Chaffs, Spanish Sparrows and the pale Cray-Martins. Besides these we saw that very characteristic plain gray warbler of the Sinai Peninsula, *Cercomela asthenia*, the Chat-Robin or Black-start. Here too we began to see the Sinai Desert Larks.

Between Gharandel and Wady Feran, where you first find real water, there is almost nothing of interest to the ornithologist. For part of a day the road runs along the coast of the Red Sea under rough cliffs, but not a gull or a shore-bird enlivens the monotony of that shell strewn shore. You begin to see some of the handsome Black and White Chats along this part of the road. We took three species, the White-rumped, Pied and Hooded Chat. These are very striking birds, extremely shy and by no means easy to get. The White-rumped has a very low but sweet song. Wherever there is any vegetation at all one sees if he looks closely, an extraordinary little wren-like cock-tailed warbler, *Scotocera iniquietus* that is an adept at hiding. If I remember rightly, it has a peculiar little Chickadee-like note which I heard long before I ever managed to get the bird. When one gets into the ravines about Petra this little bird is more plentiful. Then another very characteristic warbler of the scattered sayal trees is the Lesser White-throat which returns to Palestine and breeds in great numbers. You can identify it a long way off by its monotonous "sip-sip-sip." I think it is quite the commonest spring bird of Sinai.

On April 1, we arrived at the beautiful brook of Feran and

pitched camp at the mouth of the Wady Aleyât; to students of Bible history, one of the most interesting spots on the peninsula. Most of the ancient traditions center around this place, the ruins of an ancient church and a fine monastery crown the hill of El-Meharret, and the rocks are riddled with graves and cells of anchorites. The serrated peak of Serbal rises just to the south, the most picturesque mountain on the peninsula, and still claiming distinction as the mountain of the Law Giving, in spite of the attempts of the Greek monks to transport all the bible traditions to the neighborhood of Gebel Katherina.

The brook of Feran waters three miles of a rugged canyon filled with palms, nebk and tamarisk. The climate at this elevation is wonderful, and the bothersome flies and heat of the desert have been left behind. The Palestine Bulbul mingles his Robin-like song with the purring of the stream, and a fair number of other birds are to be found, especially at the head springs. In the thick palms a few shy Tristram's Grackles evaded my gun. We took both the Rock and the Blue Thrush, the latter supposed to be "the sparrow that sitteth alone upon the house-tops" of scripture. Then there were Redstarts, several Warblers, two species of Wagtails, Tree Pipits and Spanish Sparrows. I even saw a Snipe. In the neighboring valleys the lively little Sand Partridge was abundant. It is hard to dismiss the beautiful little See-see (*Amnoperdix heyi*) without a word of notice. He is the only fat thing in Sinai. He lives in flocks of fair size, and curiously enough, numbers are seen together even in the breeding season. One morning (April 9), I watched the mating antics of a pair of these birds. The female was squatting in the sand and the male constantly hopped over and ran around her. Every little while they would seize each other by the bills and wrestle about with much flapping of wings and their feathers flying. They kept this up for ten minutes and I had to leave them still at it.

Best of all, at Feran however, was the capture of a Butler's Owl (*Strix butleri*, see Plate XVII), our specimen making the third one known to science. The first one was sent to Hume from South Baluchistan, and the second came from Sinai. The background of the plate shows the vale of Feran and the rough outline of Mt. Serbal where the ibex and the leopard still wander.

We only spent three days at Feran and then moved south to the convent of St. Catherine. On the way, passing up the rugged defile, Nekb-el-Hawa, or pass of the winds, we met our first Rose Finches. This rare rock-loving *Carpodacus* lives only on the highest and roughest parts of the country, keeping in little scattered troops. It is a very wild and restless bird and what it manages to live upon I do not know. I saw it again only at Petra. Zedlitz (1912), says that the bird does not breed till its second year. From my specimens I should say that both sexes were rose-colored when adult, but others have described the females as plain colored, like the young males.

In the garden of the convent of St. Catherine there were a few birds but nothing that we had not seen before. A side trip to Um Shomer, a high mountain in the south, took us over an absolutely birdless region with nothing but Desert Larks and Crag Martins at the rarest intervals. One morning at sunrise I found myself high up on a spur of Um-Shomer. I thought I never had seen such desolate grandeur. Westward about fifty miles of the Gulf of Suez was in sight, bathed in a light mist, while a long stretch of the Gulf of Akaba limited the east and northeast view, backed by the low peaked mountains of Midian. The whole rugged south end of Sinai was spread out like a relief map, and not a sound came to my ears.— A single Eagle soared about the crags of Um-Shomer, perhaps looking for a young ibex, but he was all alone. Far out on the Gulf of Suez as the mist cleared I could see with my glass the big steamers plying to the ends of the world.

Some of the scarcity of birds in Sinai may have been due to lack of rain. Usually rain and snow fall every winter, but now for several years there has been practically a continual drought. The vegetation is much reduced and every sayal tree is cut back for camel food.

From the convent to Akaba at the head of the long gulf of that name, we did not see many birds. For days we journeyed along the beach of the gulf meeting very rarely a Sandpiper, or one or two European Kingfishers. At intervals there were groups of palm trees with a few Warblers, Chats and Wheatears about them.

At Akaba we had to wait eight days for our mules. A long palm grove and the remains of quite a large town with a Turkish fort

stretches along the beach. The place is interesting to students of migration for it seems to be on the great highway from northeast Africa up the great Dead Sea depression to Palestine, and so over western Asia. We took a good many birds here, among them a Land Rail in a half dead condition, a Baillon's Crake, one specimen of the rare Audouin's Gull, here far east and south of its eastern limit, a stray Burgomaster Gull, also well south of its range, some Dunlins and Greenshank and a couple of Garganey Teal. One night we saw coming north up the gulf the most extraordinary flock of hawks I have ever heard of. We judged there were 1500 to 1800 scattered out over a wide area. We shot four and they were of one species, the Levant Sparrow Hawk. Such a flock must have been migrating from Africa or perhaps south Arabia, but the species has only been taken once or twice in Egypt and never elsewhere in Africa.

Among the palm trees hundreds of splendid European Bee-eaters with their tuneful chirping were constantly at work on a small sand beetle that was just then having its nuptial flight. We saw here for the first time the curious awkward Hopping Thrush, a pale thrasher-like bird that seems really ashamed of its power of flight. It is another of the characteristic Dead Sea species.

There were a good many Fan-tailed Ravens here and many migrating Blue-headed Wagtails, besides other birds that need not be mentioned. The Fan-tailed Raven has a curious flight and sometimes tumbles like the Roller. Tristram describes its note as rich and musical. A careful two months' collecting in the Akaba palms at the proper season would produce a very rich collection of migrants.

Between Akaba and Petra our advance guard was robbed, and the Arabian soldier with it was shot and left for dead by the robbers. This was at the rise of the great plateau which bounds the eastern side of the desert of Arabah, always a bad region.

Once on top of the cliffs you reach a cold and windy region and see the first traces of rude cultivation. We did no more collecting till we reached Petra, that famous old city of the Nabataeans.

Petra is in the middle of one of the many canyons that lead down from the great Arabian plateau to the Dead Sea basin. There is

running water and a good deal of vegetation — even juniper trees among the crags. The place is justly famous as a goal for tourists and is destined to be much visited in the future. Here we found a great many migrants and saw for the first time the Palestine Sunbird. This truly African bird pushes up through the Dead Sea basin and has been found in summer as far north as Beyrout. In the cliffs of Petra were colonies of that noisy and disagreeable Rock Sparrow, *Petronia petronia*, and occasionally a pair of Tristram's Grackles, whose song has been so greatly admired by nearly all travellers in southern Palestine. Here again we met a good number of rose finches, although they have never been recorded outside Sinai before. These Petra finches turn out to be so much smaller than the Sinai birds that I have ventured to give them a new name. At Petra, too, the tamarisk bushes were full of migrating goldfinches and black capped warblers, and from this time on, the goldfinch became the commonest bird. The blue-rock pigeons, which I have not mentioned before, were found here and there in Sinai, and at Petra and farther north there were many, but wary to a degree. I never could account for the wariness of all species of birds hereabouts, a fact commented upon by Zedlitz, (1912).

We had such hard luck with our mouse traps at Petra that we had to pull them up. The jackals robbed the line as neatly as the wolverines of our northern wilds are said to do.

From Petra our road lay along the edge of the great Moab plateau. The barley was nearly ripe and the fields were full of Larks and Ortolans with here and there a Stork. These latter were astonishingly tame.

At Wady Kerak we made a side-trip to the south end of the Dead Sea. The heat there was really very trying but we obtained a few birds, among them the rare little Moabitic Sparrow whose range is perhaps the smallest in the world, as it is only known from a few patches of jungle in this immediate region. He looks like a gaudy but miniature English Sparrow with a yellow spot on each side of his throat.

Around the south end of the Dead Sea at this time (May 7) there were many birds. Arabs were just harvesting their grain, preparatory to leaving the Dead Sea for the better climate of the uplands. There were many Turtle-Doves, Blue-rocks, Hey's

Partridges, Egyptian Quail, European Rollers, Great Grey Shrikes, Crested Larks, Wheatears, Goat-suckers, and three species of Swallows, the Common European, the Red-rumped, and the Dead Sea Crag-Martin.

After we left Kerak we hurried on to Jerusalem, crossing many of the Dead Sea ravines, now filled with oleanders in full bloom. The olive groves of the various towns we passed through were well supplied with birds, and resounded with the songs of Goldfinches and Black-caps, while Greater Tits and many common warblers were present in large numbers. The only rarity we took was the Barred Warbler, which apparently has not before been taken in Palestine.

We reached Jerusalem on May 15 and after this the only birds collected were taken by Mr. Mann from the Mt. Herman region west of Damascus.

The total number of species in the collection is ninety.

STRUTHIONIDÆ.

Struthio camelus Linn. OSTRICH.— Ostrich eggs were common among the Arabs at Maan, on the Hadj Railroad. I was told that they came from the desert two days' journey east and northeast of that town.

Phasianidæ.

Caccabis chukar synaica (Bp.). CHUKAR PARTRIDGE.— One ♂; Madeba, May 10. This specimen is the same as the Jerusalem series in the Selah Merrill Coll., Museum Comparative Zoölogy, and only a little different from a Kurdestan specimen. It is much paler than birds from northern India. The chukar is scarce in Sinai but plentiful along the crest of the Moab plateau.

Ammoperdix heyi (Temm.). HEY'S PARTRIDGE; SEE-SEE.— Four specimens; Wady Hamer, Sinai, April 9, Wady Kerak, Dead Sea, May 5.

These two pairs, one from Sinai, the other from the Dead Sea, differ markedly; enough to suggest two forms. Comparison with the Selah Merrill series of over 30 in the Museum of Comparative Zoölogy, taken near Jerusalem, does not bear this out, for this series shows a great range of color. Some males are much darker all over than others; some females are barred all over the under parts, while some are nearly plain buff-colored. Nicoll (Ibis, 1909, p. 640) in discussing the African form *A. h. cholmleyi* O. Grant, refers to the presence or absence of white lores and forehead in Egyptian specimens. *A. h. cholmleyi* is supposed to lack the white lores

and forehead, but Nicoll shows that this is not constant at least for Egypt. The type locality of *A. h. cholmleyi*, however, is near Suakin, Sudan (O. Grant, Hand-Book of Game Birds, Vol. II, p. 294), where it is conceivable that a form different from the Egyptian one may exist. At any rate the Jerusalem series shows no variation in the white lores and forehead.

Coturnix coturnix coturnix (Linn.). EGYPTIAN QUAIL.— One ♂; Moses Wells, Suez, March 23. Seen only at above place and around Dead Sea.

Pteroclididæ.

Pterocles lichtensteini arabicus Neumann.— One ♂; Akaba, April 14.

The type locality of the true *lichtensteini* is from Nubia (Temm. Coll., Pl., Vol. V, pls. 25–26). This is based on Lichtenstein (Verz. Doubletten 1823, p. 65). Nubia as used there included Sennar and part of Abyssinia and was rather a vague term.

In 1905 Erlanger (J. F. O., 1905, p. 92) separated a race, *P. l. hyperythrus*, from southern Somaliland, at the same time limiting *P. l. lichtensteini* to northern Abyssinia and northern Somaliland.

Later on Neumann described two other forms, *arabicus* from southern Arabia and *sukensis* from East Africa (Ornith. Monatsbr., 1909, p. 152).

My single specimen, taken from a flock of 10 or 12 birds on the Sinai side of the gulf near Akaba, extends somewhat the northwesterly range of the species. There are other specimens collected by Burton in "Midian" and at Jedda (Shelley Coll.).

I have for comparison seven males from Hawash R., northern Abyssinia, and six males from British East Africa, besides a number of females. These specimens are mostly from the U. S. Nat. Mus. collection. The first series is not far from the type locality of *P. l. lichtensteini* and the second series should represent *P. l. sukensis*.

The form *arabicus* which my own specimen represents is said to differ from true *lichtensteini* by a general lighter and brighter color. The upper tan-colored breast band of the same shade as the lower breast band, and not darker as in *P. l. lichtensteini*. The lower black band, separating breast from abdomen, much reduced or nearly absent, and the abdomen itself lighter. The golden bars on the upper side as wide or wider than the black bands, etc. In my specimen, however, not all of these characters are present, for the species is itself extremely variable. The lower black breast band is not reduced but the belly is lighter than any of the African specimens. The lower tan-colored breast band is very similar in color to the upper band, but in the type species, the two areas sometimes closely resemble each other. The character of barring on the upper side is a very variable one and I should say of little value in separating *arabicus* from *lichtensteini*. The only constant character then, as far as my series goes, is the very light belly area of the Arabian race.

P. l. sukensis would appear to be a very poorly marked southern race of the type species. I have seen no specimens from the locality of *P. l. hyperythrus*.

COLUMBIDÆ.

Columba livia schimperi Bp. ROCK PIGEON.— This form, now confined to Sinai (*Zedlitz*, Jour. für. Ornith., 1912), and also *C. l. palestinæ* Zedlitz from Palestine, were probably both taken. None were preserved, so I can throw no light upon the existence of these two forms, whose validity must still be open to question.

Turtur turtur (Linn.). TURTLE DOVE.— One ♂; Shobek, April 30. Met with in large numbers in the Dead Sea gorges.

RALLIDÆ.

Crex crex (Linn.). CORN CRAKE.— Pair; Akaba, April 19; Shobek, Palestine, April 30.

Porzana pusilla Pall. BAILLON'S CRAKE,— One ♀; Akaba, April 20. According to Reichenow there may be a resident form of this species in Africa.

LARIDÆ.

Larus hyperboreus Gunnerus. GLAUCUS GULL.— One ♂; Akaba, April 18. A far southern record for this gull.

Larus audouini Payraudeau. AUDOUIN'S GULL.— One ♀; Akaba, April 21. Wing 15.5 in.; bill 2.4; tarsus 2.25; tail 6.5. This rare gull is east and southeast of its known range in the Western Mediterranean. Its eastern limit is the Greek Islands but most, if not all, of the specimens have come from west of Italy. Tristram is quoted as having observed the bird at Malta and Dresser says it has been seen near Cairo.

LIMICOLÆ.

Pelidna alpina alpina (Linn.). DUNLIN.— One ♂; Akaba, April 17.

Tringa nebularia Gunner. GREENSHANK.— One ♀; Akaba, April 20.

ARDEIFORMES.

Pyrrherodias purpurea (Linn.). PURPLE HERON.— One ♂; Akaba, April 18.

ANATIDÆ.

Querquedula circia (Linn.). GARGANEY TEAL.— Two shot at Akaba, April 17.

FALCONIDÆ.

Astur brevipes Severtzoff. LEVANT SPARROW HAWK.— Four ♂ ♂; Akaba, April 20. A flock of 1200 to 1800 apparently all of this species seen migrating north on this date. This bird is very rare in Egypt and has not been taken in Africa (outside Egypt). This migration was perhaps from southern Arabia. The specimens were very fat but their stomachs were empty.

Cerchneis tinnunculus (Linn.) KESTREL.— One ♂; Tafeleh, southern Palestine, May 3.

STRIGIDÆ.

Strix butleri Hume. BUTLER'S OWL. (Plate XVII).— One ♂; Wady Feran, Sinai, March 31. Wing, 245 mm., tarsus, 48 mm., tail, 150 mm. This specimen, apparently an adult male, was brought into camp alive by an Arab. It constitutes the third known record of this extremely rare owl. In size it seems to be the same as both the other specimens. In color also it corresponds very closely with Hartert's description (Vogel der Pal. Fauna, p. 1027) and this description is based on both the other specimens. From Hume's original description of the type (Stray Feathers, VII, p. 316) my specimen apparently differs in having the first primary less plain colored and more like the others as to its barring.

Hume's bird came from Omára, on the Mekran coast of southern Baluchistan in 1878; the skin was badly damaged. In 1879 Tristram (Stray Feathers, VIII, p. 417) discovered one other skin that had remained unidentified in his own collection for ten years. This one was from Mt. Sinai (exact locality not given).

This owl must be a rock-living bird. The plate shows typical Feran scenery with Mt. Serbal in the background.

HALCYONIDÆ.

Alcedo ispida pallida Brehm. KINGFISHER.— Two ♂♂; Akaba, April 15. Zedlitz (1912) in his work on Sinai, throws out this rather poorly marked form. The beak is usually thinner and more pointed than in the western birds.

MEROPIDÆ.

Merops apiaster Linn. EUROPEAN BEE-EATER.— Three; Akaba, April 16.

CAPRIMULGIDÆ.

Caprimulgus europœus meridionalis Hartert. NIGHT-JAR.— One ♂; Wady Kerak, Palestine, May 5.

MICROPODIDÆ.

Apus apus apus (Linn.). SWIFT.— Three ♀ ♀; Shobek, Palestine, April 30. These are the same size as examples from England. They might be referred to the *marwetzi* of Reichenow but that race is poorly marked and our material is insufficient.

Apus murinus murinus (Brehm). PALLID SWIFT.— One ♀; Shobek, April 30.

HIRUNDINIDÆ.

Chelidon rustica rustica Linn. SWALLOW. Five; Akaba, April 14; ain Hodra, Sinai, April 10; Wady Ain Heisha, Syria, May 31.

Chelidon rustica transitiva Hartert. PALESTINE SWALLOW.— One ♀; Nuheibeh, Sinai, April 13.

Chelidon daurica rufula (Temm.). RED-RUMPED SWALLOW.— One pair; Dead Sea, May 6; Madeba, May 10.

Hirundo urbica urbica Linn. HOUSE MARTIN.— Five; Petra, South Palestine, April 28–29; Shtôra, Syria, June 8.

Riparia riparia riparia (Linn.). SAND MARTIN.— Four; Moses Wells, Suez, March 23.

Riparia obsoleta obsoleta (Cab.). PALE CRAG-MARTIN.— Five; Gharandel, Sinai, March 25; Wady Feran, March 31; Petra, April 27; Wady Hisa, May 3.

MUSCICAPIDÆ.

Muscicapa striata neumanni Poche. EASTERN SPOTTED FLY-CATCHER.— Nine; Petra, April 28; Wady Hisa, May 4; several Syrian localities, May and June.

BRACHYPODIDÆ.

Picnonotus capensis xanthopygos (Hemp. & Erlich.). PALESTINE BULBUL.— Pair; Wady Feran, March 31.

TIMELIIDÆ.

Crateropus squamiceps squamiceps (Cretzschm.). HOPPING THRUSH.— One ♀; Akaba, April 21.

TROGLODYTIDÆ.

Nannus troglodytes pallidus Hume. WREN.— Two ♂ ♂; Sheba, Syria, May 25.

These two specimens appear to belong to this form as nearly as can be

told from Hartert's description (Vog. d. Pal. Fauna, p. 781). Certainly they are not like *N. t. cypriotes* from Cyprus. They are not red-brown like the European examples and are pale and nearly unbanded on the lower sides. The wing is 46 and 48 mm. The wren is very rare in Syria.

TURDIDÆ.

Monticola saxatilis (Linn.). ROCK THRUSH.— Two ♂♂; Wady Feran, March 31; Shobek, Palestine, May 1.

Monticola solitarius solitarius (Linn.). BLUE THRUSH.— Pair; Wady Feran, Sinai, March 31.

Phœnicurus phœnicurus phœnicurus (Linn.). REDSTART.— Six; Wady Feran, March 31; Monastery, Sinai, April 9; Akaba, April 21; Shobek, Palestine, April 30; Ain Gleidat, May 2.

Luscinia luscinia (Linn.). NIGHTINGALE.— Three; Petra, April 28; El Katuma, Syria, May 20; Mimis, Syria, May 30.

Cercomela melanura melanura Temm. PALESTINE BLACKSTART.— Seven; Wady Feran and Wady Saal, Sinai, March 29–31, April 7.

Œnanthe œnanthe rostrata Hemp. & Ehrb. WHEATEAR.— Ten; Gharandel, March 25; Wady Feran, March 31; El Hawa, April 3; Nuhuibeh, April 13; Akaba, April 20. The wing bands of these specimens are not very apparent, so that one of the characters of this race is lacking. The bills are 17 to 18 mm., a little short. This poorly marked form migrates to Egypt, Somaliland and German East Africa. It is a variable race as Tristram and Hartert have both pointed out.

Œnanthe isabellina (Cretzschm.). ISABELLINE WHEATEAR.— One ♂; Shobek, Palestine, May 1.

Œnanthe lugens lugens (Licht.). PIED CHAT.— One ♂; Shobek, May 1.

Œnanthe leucopyga (Brehm). WHITE-RUMPED CHAT.— Three; Wady Feran, April 1; Wady Garbeh, April 2.

Œnanthe monacha (Temm.). HOODED CHAT.— Two; Wady Feran, March 29; Nuheibeh, April 13.

Œnanthe melanoleuca finchii (Heugl.). BLACK-THROATED WHEATEAR.— Four; Ain Hodra, Sinai, April 10; Akaba, April 19; Tafileh, May 3; Shiba, Syria, May 25.

SILVIIDÆ.

Agrabates galoctotes galoctotes (Temm.). RUFOUS WARBLER.— Two ♂♂; Shobek, April 30; Rasheya, Syria, May 21.

Locustella fluviatilis (Wolf). RIVER WARBLER.— One ♂, Tafileh, southern Palestine, May 3. This rather rare bird was taken by Tristram in northern Palestine.

Acrocephalus strepera strepera (Vieill.). REED WARBLER.— Two;

Hibariyeh, Syria, May 28. One of the specimens is certainly a breeding bird. Tristram mentions the species but it has not definitely been recorded from Palestine.

Hippolais languida (Hemp. & Ehr.). UPCHER'S WARBLER.— Three; Rasheya, Syria, May 21, June 1.

Hippolais pallida pallida (Hemp. & Ehrb.). OLIVACEOUS WARBLER. — Five; Akaba, April 16; Tafileh May 2; Wady Hisa, May 3; Litany River, Syria, June 4.

Sylvia nisoria nisoria (Bechst.). BARRED WARBLER.— One ♂; Shobek, May 1. The wing is 84 mm., which is small, so that it does not belong to the rather doubtful eastern race, *Merzbacheri*.

This rather local bird has not been recorded from Palestine before, but has been taken in Asia Minor, Persia, and central Asia. The winter quarters of the eastern breeding birds are unknown.

Sylvia communis icterops Ménétr. EASTERN WHITE-THROAT.— Two; Wady Gazella, Sinai, April 10. Saghbin, Syria, June 5.

These are the same as the Selah Merrill series from Jerusalem; not so red-brown on the back as European birds.

Sylvia ruppelli Temm. RUPPELL'S WARBLER.— Nine; Gharandel, March 25; Moses Wells, March 23; Wady Feran, March 27–28; Wady Gharbeh, April 2.

Sylvia hortensis crassirostris Cretzschm. ORPHEAN WARBLER.— Two; base of Mt. Hermon, Syria, June 2.

Sylvia curruca curruca (Linn.). LESSER WHITE-THROAT.— Six; Moses Wells, March 22–23; Wady Feran, March 27–31; Ammik, Syria, June 6.

Sylvia atricapilla atricapilla (Linn.). BLACK-CAP.— Eight; Akaba April 16–18; Petra, April 27–29; Tafileh, May 2; Rasheya, Syria, May 21.

Phylloscopus sibilatrix sibilatrix (Bechst.). WOOD-WREN.— One ♀; Tafileh, May 2.

Phylloscopus bonelli orientalis (Brehm.). BONELLI'S WARBLER.— Gharandel, March 25; Wady Feran, Sinai, March 27–30; Wady Saal, April 8.

Phylloscopus collybita (Vieill.). CHIFF CHAFF.— Three; Wady Gharandel, March 25; Petra, April 27. The wing of the ♂ is 62, ♀ ♀ 56 and 57. They are therefore rather too small for *P. c. abietina* (Nilss.), the eastern race. In color they resemble specimens from England and they are certainly no paler. I cannot make out the eastern race from my material.

LANIIDÆ.

Lanius excubitor aucheri Bp. GREAT GREY SHRIKE.— Four; Wady Gharandel, March 25; Wady Feran, April 1; Wady Haman, Sinai, April 9.

Lanius nubicus (Licht.). MASKED SHRIKE.— Two; Akaba, April 16–20.

Lanius senator niloticus (Bp.). EASTERN WOOD-CHAT SHRIKE.— Five; Tafileh, Palestine, May 2 and 3; Ammik, Syria, June 6; Baneyas, Syria, May 28.

Lanius collurio collurio Linn. RED-BACKED SHRIKE.— One ♂; Wady Hisa, May 4.

PARIDÆ.

Parus major terræsanctæ Hart. PALESTINE GREAT-TIT.— Two; Tafileh, Palestine, May 2–3.

NECTARINIDÆ.

Cinnyris osea Bp. PALESTINE SUN-BIRD.— One ♂; Petra, April 27. I found this a rare bird.

MOTACILLIDÆ.

Motacilla alba alba Linn. WHITE WAGTAIL.— Three; Moses Wells, Suez, March 23; Wady Feran, April 1; Abu Sweira, Sinai, April 13.

Budytes flava flava Linn. BLUE-HEADED WAGTAIL.— Four; Wady Feran, Sinai, March 31; Akaba, April 19–21; Shobek, Palestine; April 30.

Budytes melanocephala Licht. BLACK-HEADED WAGTAIL.— One ♂; Wady Feran; Sinai, March 29.

Anthus trivialis (Linn.). TREE-PIPIT.— Five; Wady Feran, Sinai, March 31; Wady El Ain, April 12; Nuheibeh, Sinai, April 13; Akaba, April 15.

Anthus campestris campestris (Linn.). TAWNY PIPIT.— One; Ain Gleidat, Palestine, May 2.

ALAUDIDÆ.

Otocorys alpestris bicornis Brehm. MT. HERMAN HORNED LARK.— Two ♂♂; Mt. Hermon, May 24.

Melanocorypha calandra calandra (Linn.). CALANDRA LARK.— Three; El Kerak, Palestine, May 7; Saghbin, Syria, June 5; Ammik, Syria, June 6.

Melanocorypha bimaculata. Ménéts. EASTERN CALANDRA LARK.— Two; Ammik, Syria, June 6; Rasheya, Syria, June 2.

Calandra brachydactyla brachydactyla Leisl. SHORT-TOED LARK.— Two ♂♂; Ain Gleidat, Palestine, May 2; Madeba, Palestine, May 10.

Ammomanes deserti katherinæ Zedlitz. SINAI DESERT LARK.— Three; Wady Feran, Sinai, March 29; Monastery, Sinai, April 3.

Zedlitz has described this form from the high parts of Sinai and thinks it differs from the lark around the low deserts of Suez and Egypt, *A. d. isabellina*. He writes that it has a more lively voice and its wings make a whistling sound when it flies! It is said to be more grey and less red on the upper side than *isabellina*, and with a larger bill than *fraterculus* of

Palestine. Its coloration is described as the same as that of *fraterculus*. All these forms are certainly poorly marked, but Sinai birds can at least be told from Palestine ones by their larger bills. It appears somewhat doubtful whether a mountain and a desert form can exist side by side in Sinai for there would be apt to be a seasonal movement up and down the mountains.

FRINGILLIDÆ.

Chloris chloris chlorotica (Bp.). PALESTINE GREEN FINCH. Eight; Mt. Hermon region, May 22–June 7.

Carduelis carduelis carduelis (Linn.). GOLDFINCH.— Three; Petra, April 27; Ammik, Syria, June 6.

Petronia petronia puteicola (Festa). PALESTINE ROCK SPARROW.— Four; Petra, April 27–29; Rasheya, Syria, May 21.

Carpospiza brachydactyla (Bp.). DESERT ROCK SPARROW.— One ♂, Rasheya, Syria, May 21.

Acanthis cannabina fringillirostris (Bp. and Schleg.). EASTERN LINNET.— Seven; Mt. Hermon region, May 24–25.

Passer domesticus indicus Jardin & Selby. EASTERN HOUSE SPARROW.— One ♂; Tafeileh, Palestine, May 2. Wing 75 mm., cheeks pure white. This specimen is too small for *biblicus* of Palestine and Syria. It appears to be typical *indicus*. The head cap is very dark grey as in all old birds.

The exact range of *P. d. indicus* is still in doubt. Hartert thought that southern Arabian specimens belonged to this form, which extends over India, Persia and China, but becomes intermediate to *P. d. domesticus* in the Transcaspian region.

Lorenz and Hellmayr (Denkschrif akad. der Wissenschaften, 1907, p. 106) describe a new subspecies of house sparrow from southern Arabia, east of Aden. From their description I cannot see that this is anything more than an early winter plumage of *indicus*. It certainly is very close to *indicus* and differs only in being "brighter."

Zedlitz, 1912, in his work on Sinai birds (Jour. für Ornith., 1912, p. 566), takes up this question. He quotes Le Roi as saying that Sinai sparrows do not conform to *biblicus* or *indicus* and still less to the *niloticus* of Nicoll & Bonhote. Zedlitz's own single specimen from Sinai and five others collected by Koenig, were, he says, small and not like *biblicus*.

He arranges the sparrows of Western Asia as follows:

1. Sinai and southern Palestine. Much smaller than *biblicus* ♂. Wing, 80; ♀, 74–79. Color whiter than *niloticus*, ear coverts grey.

2. *P. biblicus*; confined to Syria and Palestine. Large. Wing, 82–84. Ear coverts light grey.

3. Asia Minor Sparrow. (Eight specimens.) Wing, 78–81. Ear coverts almost white, or extremity light grey.

4. *P. indicus*; India & Persia, limits not known. Size small, like Sinai

birds. Wing, 74–78. Ear coverts mostly pure white like the sparrow of Asia Minor.

Larger series are necessary to clear up the disputed points.

Passer hispaniolensis transcaspicus Tschusi. SPANISH SPARROW.— Six; Wady Gharandel, Sinai, March 26; Feran, March 31; Mt. Hermon region, Syria, May 22–25.

Passer maobiticus maobiticus Tristr. DEAD SEA SPARROW.— One (sex?); mouth of Wady Kerak, May 8. I think this specimen comes from a region a little north of the known range of this sparrow. Wady Safye is the nearest point south, where it has been taken. I saw only this one bird in the cane jungles at the edge of the sea; there may have been many more sparrows in this cane, however, as the jungle is almost impenetrable at this point.

Serinus syriacus Bp. SYRIAN CANARY. One ♂; Ammik, Syria, June 7.

Carpodacus synoicus (Temm.). SINAI ROSE FINCH.— Seven; Pass of Hawa, Sinai, April 3; Petra, April 27–29.

This species does not appear to have been taken outside of the Sinai Peninsula before; but I found it common at Petra and secured five specimens there. These birds are smaller than Sinai specimens. Wing, 81 to 84 mm.; exposed culmen, 9 to 9.5; tarsus, 19; tail, 65–69.

Temminck's type was taken near "Mt. Sinai" and was presumably drawn to scale (Temm. Pl. Col. 375). The wing on the plate measures 87 mm. Hartert gives the wing of this species as 86–89. The wings of my Sinai adults are 85 mm. I therefore propose the name of

Carpodacus synoicus petræ, SUB. SPEC. NOV.

for the northern birds, separated as they are from Sinai, by the great low desert of the Arabah.

Type, ♂ No. 66024, Mus. Comp. Zoöl., collected at Petra, southern Palestine, April 28, 1914, by J. C. Phillips.

Characters. Like *C. s. synoica* (Temm.) but smaller, especially in the wing and bill. Wing, 84 mm. or under; bill shorter and narrower; exposed culmen, 9–9.5; tarsus, 19 mm. Rosy parts of the plumage slightly paler and more pinkish.

I am somewhat in doubt about the plumage of the adult females in these two forms. It has always been given as plain brown, like the young males, but I carefully sexed one of my adult rosey specimens as a female. The proportion of rosy birds as I saw them in the wild was rather too large for the supposition that only old second year males attain this plumage.

Emberiza hortulana. ORTOLAN BUNTING.—Four; Akaba, April 15–18; Ain Abu-Heran, April 23; Petra, April 29.

Emberiza cæsia Cretzschm. CRETZSCHMARS BUNTING.— Three; Syria, May 27–30.

Emberiza melanocephala Scop. BLACK-HEADED BUNTING.— Eleven; Mt. Hermon region, Syria, May 27, June 7.

EULABETIDÆ.

Amydrus tristrami tristrami (Scl.). TRISTRAM'S GRACKLE.— One ♂; Wady Kerak, Dead Sea, May 7.

CORVIDÆ.

Covus affinis Rüpp. FAN-TAILED RAVEN.— One ♂; Akaba, April 18.

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THE FOSSIL REMAINS OF A SPECIES OF HESPERORNIS FOUND IN MONTANA.

BY R. W. SHUFELDT, M.D.

Plate XVIII.

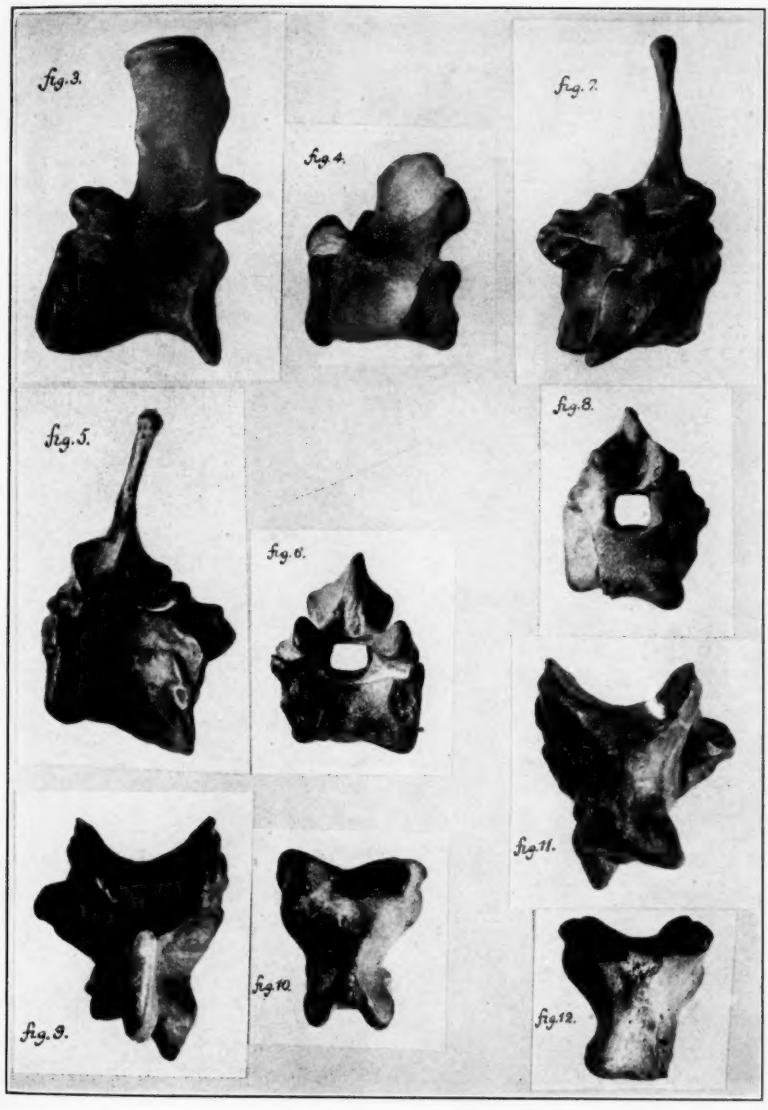
EARLY in November, 1914, Mr. Charles W. Gilmore, who has charge of the fossil birds and reptiles in the Division of Palæontology of the United States National Museum, Washington, D.C., sent me a fossil vertebra, which was collected when he was associated with Dr. T. W. Stanton on an expedition in Montana during the early autumn of 1914. This vertebra, when received by me, was labeled thus:

"Coniornis altus Marsh, Lumbar vertebra, Dog Creek, 1 mi. above its mouth, Fergus County, Montana. Cretaceous Clagget formation (upper yellowish sandstone) September 26, 1914." T. W. Stanton, C. W. Gilmore. All. No."

There being no proper material in the collections of the U. S. National Museum wherewith to compare this vertebra, I studied it as best I could through comparing the fossil bone with the figures given by Marsh in his *Odontornithes*. This comparison convinced me of the fact that the vertebra belonged to some medium-sized *Hesperornis;* further, that it more closely resembled the 23d vertebra of the spinal column of *Hesperornis regalis* than it did any other vertebra, and I was therefore led to believe that it was the corresponding vertebra of some species of *Hesperornis*, smaller than *H. regalis*, probably of a species heretofore undescribed.

As I knew that Doctor Richard S. Lull, of the Peabody Museum, was engaged upon a study of the *Hesperornithidæ*, at the time this bone came to me for study, I determined to refer it to him for an opinion. This I did with a letter dated at Washington, D. C., the 10th of November, 1914.

Doctor Lull very kindly made an exhaustive study of this fossil vertebra, and returned it to me with a letter of transmittal, dated November 20, 1914. At the close of his communication on the subject, he says: "I will lend you a cast of the 23d vertebra of



REMAINS OF HESPERORNIS IN MONTANA.

H. regalis No. 1207, but as it is one of a set of casts we would like to have it returned when you are through with it."

Reproductions of my photographs of this cast, together with those of the vertebra here being considered, are exhibited on Plate XVIII.

The following is Dr. Lull's paper in full:

"It is evidently the last dorsal vertebra, the 23d, hence was compared with the equivalent bone of three specimens of *Hesperornis regalis*, the mounted specimen, Cat. No. 1206, and *Hesperornis* Nos. 1477 and 1499. Also with the second mounted specimen, *Lestornis crassipes*, holotype, Cat. No. 1474.

"The new bone has suffered from fracture and abrasion, by which certain of the fractured surfaces, e. g., stumps of the transverse processes, are smoothed over and rendered deceptive.

"It is smaller than any of the four equivalent bones, though there is as much range among them as between the least of them and the new bone.

"It differs from the other three but resembles No. 1477 in the manner in which the neural spine arises, in that the forward margin as preserved has a slight backward instead of a forward inclination. The new specimen differs from all four but resembles No. 1499 most closely, in that the lateral walls of the centrum are not so deeply excavated. In No. 1499 this depression is slight, but more marked than in the new specimen, and its greatest depth lies further to the rear. There is a decided ridge leading from the postzygapophysis to the base of the transverse process in three of the vertebræ. This is obsolete in the new bone and also in 1499.

"The anterior articular face seems to be less deeply excavated in the new specimen than in any of the four at Yale. This difference, however, may be more apparent than real, as the lateral limitations of this face are chipped and worn away. A very slight hæmal spine is represented by a broken area in all five vertebræ. Herein there is essential agreement.

"Vertebra No. 1499, *Hesperornis sp.*, comes the nearest to the new bone in size and general appearance, differing therefrom in being proportionately somewhat longer; this difference is, however, heightened by the broken character of the new specimen. A further distinction lies in the fact that, whereas in the new specimen

the prezygapophyses are buttressed by a sharp-edged ridge of bone extending from above the stump of the rib facets somewhat obliquely inward and upward, in 1499 there is in this place a distinct transverse crease instead of a vertical buttress. A rounded vertical forward margin in place of the sharp-edged buttress characterizes the other three Yale specimens, and the crease in 1499 may have been accentuated if not caused by the slight vertical crushing to which the bone has been subjected.

"Such distinctions as I can see are certainly not generic, and so far as the actual bones go, specific contrasts are hard to find. The distinctions between *Lestornis crassipes* and *Hesperornis regalis*, for instance, lie in other bones than this vertebra, so that had I the 23d vertebræ alone for comparison, I could hardly distinguish them specifically — certainly not generically. I am sure the new bone is that of a species of *Hesperornis*, possibly new, though this belief is based mainly on geographic rather than on anatomical distinction.

"The bone No. 1499 is not specifically determined if it is not *H. regalis*."

With reference to the exact locality, where this vertebra was found, and other data, Mr. Charles W. Gilmore has given me the following valuable and interesting information. "The vertebra (Cat. No. 8199) was found by Dr. T. W. Stanton on Dog Creek, Montana, on the left hand side of the valley about one mile above its mouth. The bed from which the vertebra was collected is now assigned to the Claggett formation because it is marine, while the overlying Judith River deposits are freshwater with a few intercalated brackish-water beds.

"The specimen is from the upper yellowish sandstone from a fossiliferous band containing numerous sharks' teeth, vertebræ and teeth of other fishes.

"The only other bird remains known from this area is the type of *Coniornis altus*, reported by Hatcher [1] as coming from 'near the base of the Judith River beds on Dog Creek.'

"Since the *Coniornis* type was collected some years prior to the differentiation of these exposures into successive and distinct

[1] Bull. No. 257, U. S. Geological Survey, 1905, p. 99.

formations, it is quite probable that both specimens came from the same geological level."

Professor Marsh was firmly convinced that the great toothed divers of the extinct genus *Hesperornis* were confined to the Cretaceous Beds of Kansas. So tenacious was he of this opinion that, when the fossil remains of a big extinct diver came into his possession, having been collected in Montana by Hatcher, he was very loath to consider it a species of *Hesperornis*, notwithstanding the fact that the fossil bones presented strong hesperornithine characters. He therefore created a new genus — *Coniornis* — to contain it.

Now the vertebra found by Doctor Stanton has been shown by Doctor Lull and myself to have undoubtedly belonged to a species of *Hesperornis*, and the specimen practically presents the same characters as the fossil vertebra of a *Hesperornis* in the Yale University collection, No. 1499, though there are a few appreciable differences.

Up to the present time, science has nothing to show by way of proof that the long bones, described by Marsh as belonging to a big extinct diver which he named *Coniornis altus*, belonged to the same species from an individual of which came the vertebra discovered by Doctor Stanton.

Basing my opinion on the proportions existing between the 23d vertebra of *Hesperornis regalis* and the tibio-tarsus in that species — as compared with the proportions of the vertebra here being considered and with the tibio-tarsus of the species Marsh described as *Coniornis altus* — I should say that the vertebra found by Doctor Stanton belonged to a somewhat smaller species of *Hesperornis* than did the long bones of Marsh's *Coniornis*, which latter is also a *Hesperornis* as I have elsewhere pointed out.

I herewith propose a provisional name for this apparently new species of *Hesperornis*, basing it upon the vertebra described in this paper. I suggest the name for it of *Hesperornis montana*.

Possibly, in the future, more fossil material of the *Hesperornithidæ* may be found in the above named formation in Montana; and this material may go to show that all the forms here named and considered belonged to the same species, they being distinguished only by such differences as may have been due to age and sex. On the

other hand — and what appears to me to be more likely — the discovery of additional material may conclusively prove that the several individuals here considered were distinct species, which now, at least, seems evident in the case of the one numbered 1499 in the Yale Museum.

PLATE XVIII.

[All the figures in the Plate are reduced to about three-fourths the actual size of the specimens shown. R. W. S.]

FIG. 3. Left lateral view of the cast of the 23d vertebra of *Hesperornis regalis*. Belongs to a set in the collection of Yale University Museum. Other views of this cast are given in Figs. 5, 7, 9 and 11.

FIG. 4. Direct left lateral view of the vertebra of *Hesperornis montana*. Other views of this fossil bone are given in Figs. 6, 8, 10 and 12.

FIG. 5. Direct anterior view of the cast of the 23d vertebra of *Hesperornis regalis*. Same specimen as Fig. 3 and others.

FIG. 6. Direct anterior view of the 23d vertebra of *Hesperornis montana*. Same as shown in Fig. 4 and others.

FIG. 7. Direct posterior view of the cast of the 23d vertebra of *Hesperornis regalis*. Same specimen as Fig. 5 and others.

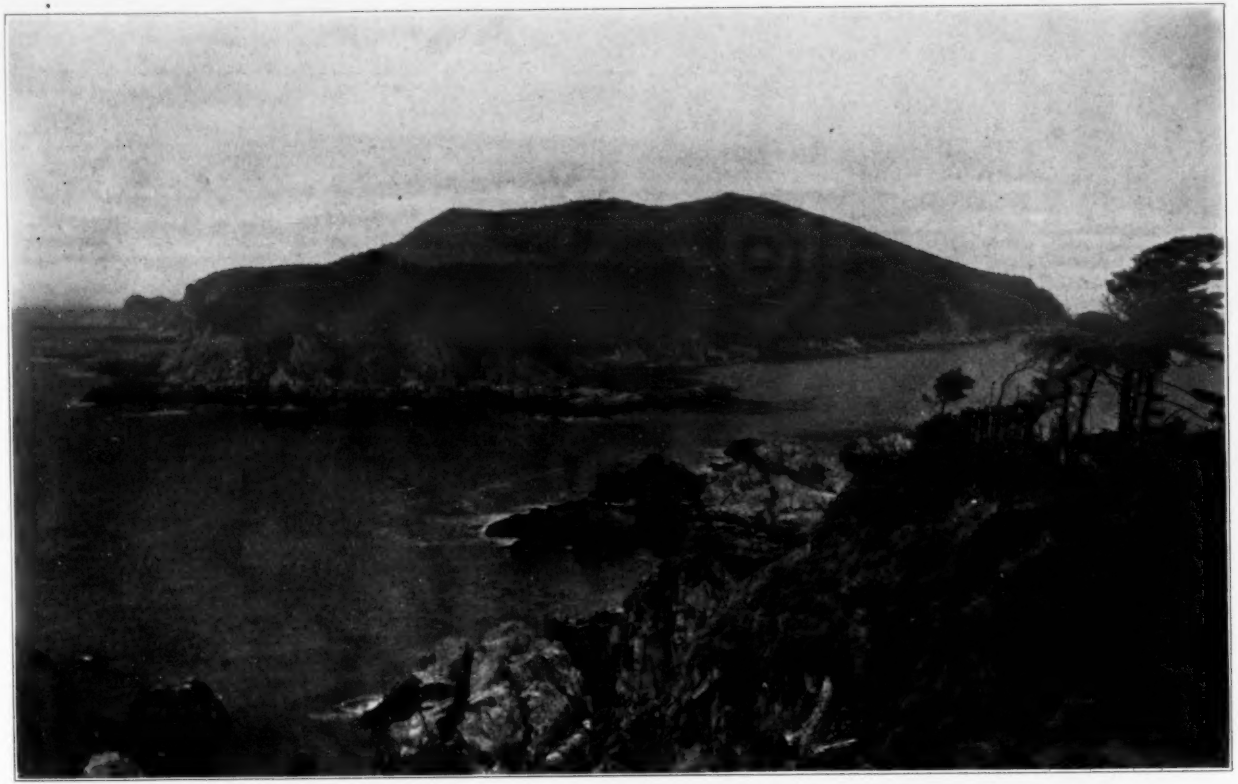
FIG. 8. Direct posterior view of the 23d vertebra of *Hesperornis montana*. Same fossil as shown in Fig. 6 and others.

FIG. 9. Direct dorsal view of the cast of the 23d vertebra of *Hesperornis regalis*. Same specimen as shown in Fig. 7 and others.

Fig. 10. Direct dorsal view of the 23d vertebra of *Hesperornis montana*. Same fossil as shown in Fig. 8 and others.

FIG. 11. Direct ventral view of the cast of the 23d vertebra of *Hesperornis regalis*. Same specimen as shown in Fig. 7 and others.

FIG. 12. Direct ventral view of the 23d vertebra of *Hesperornis montana*. Same fossil as shown in Fig. 8 and others.



FORRESTER ISLAND FROM THE WEST SIDE OF PETREL ISLAND.

SUMMER BIRDS OF FORRESTER ISLAND, ALASKA.

BY GEORGE WILLETT.

Plates XIX–XX.

DURING the period from May 23 to August 15, 1914, the writer was stationed on Forrester Island, Alaska, in the interests of the U. S. Biological Survey. What time could be spared from routine duties was occupied in study of the bird life in this most interesting section. The following account is taken from notes made at this time.

Forrester Island is of volcanic origin, and is between four and five miles long by one and a half miles wide at the widest part. It is heavily timbered with spruce, hemlock and squaw pine from the water's edge up to the top of the island, 1395 feet at the highest point. The island is situated in 54° 45′ north latitude, being about 12 miles directly west of Dall Island and southwesterly from Prince of Wales Island, and only a short distance north of the Canadian boundary. There are several small islets lying a short distance off the main island, the most important of which are Petrel Island at the south end, and Cape Horn and Sea Lion Rocks, and Lowrie Island at the north end. Lowrie Island is low and well timbered, while Petrel Island is higher, more rocky and timbered only toward the top.

These are all included in the Forrester Island Bird Reservation, as is also Wolf Rock, a bare rocky islet lying about ten miles north of the north end of Forrester. With the exception of this latter locality, all parts of the reservation were visited by the writer, most of them several times. Practically all the time that could be spared to ornithological investigation was devoted to the study of the water birds, consequently the notes on land birds must be considered very incomplete. There were more land birds in this locality than I have ever noted in any other section of southeastern Alaska. As will be seen, however, the number of species is not great.

The climate is about the same as that of adjacent sections, being

exceedingly moist at all times, the rain fall probably closely approaching 100 inches annually. During the past summer there were only occasionally days of good weather, the major part of the season being rainy or windy, frequently both.

There was a camp of several hundred fishermen on the island. They were engaged in trolling for king salmon which were generally abundant.

The following is an annotated list of birds observed.

Gavia sp.?— Loons were noted at a distance several times during the summer, but I was never able to approach them closely enough to be positive as to the species. The Pacific Loon (*Gavia pacifica*) was common in the channel west of Prince of Wales Island, May 22, evidently on the northward migration.

Lunda cirrhata. TUFTED PUFFIN.— The most abundant of the Alcidæ. Estimated numbers, 35,000 pairs. This species began to deposit the eggs about the second week in June. The principal colonies are on the west side of the main island, on Petrel Island and on Cape Horn Rocks.

The fishermen detest these birds because of their penchant for stealing the herring that is used as bait in trolling for salmon. After the fisherman has placed a fresh herring on the hook and lets the line out to trolling distance, the puffin will dive and neatly remove the bait from the hook. I have seen this done when the bird was forced to go down at least fifteen fathoms. Apparently a puffin will attach itself to a particular trolling boat and will follow it for hours. The fishermen attribute to the bird a surprising amount of cunning. One Norwegian assured me solemnly that the parrot would rise up on the crest of a wave and look into the boat in order to count the herring therein. Their eyesight is deficient at times, however, as they will sometimes dive after a spoon. Frequently the puffins will get all the herring the fisherman has and he will be obliged to cease fishing or have recourse to a spoon, which latter method is not nearly so successful as to results. As far as I was able to ascertain, this habit of stealing bait is confined to this species, the Horned Puffin apparently not having acquired it.

Fratercula corniculata. HORNED PUFFIN.— Nowhere very abundant but fairly well distributed along the shores of the main island, also on Petrel Island and Cape Horn Rocks. Probably 1000 to 1200 pairs in all. Generally nesting in small colonies of from five to twenty pairs each. No nests were seen in burrows, all those noted being in cavities in cliffs and in crevices in caves and under boulders, never more than a hundred feet (generally less than fifty feet) above the water. The nesting location is much more similar to that of the Pigeon Guillemot than to that of the Tufted Puffin. The nest is very frequently so far back in a cavity as to be impossible to approach closely. The nesting cavity is generally fairly well lined with

grass, frequently supplemented with a few feathers. The eggs are deposited during the last ten days in June. The first young were noted July 22, but some were probably out several days earlier. A few of the eggs of this species are quite heavily spotted with brown but the majority are indistinguishable from those of the last. The feeding habits of the Horned Puffin are very similar to those of the Tufted Puffin but, as a rule, they seem to feed closer to shore, frequently being seen in small flocks inside the kelp patches.

Cerorhinca monocerata. RHINOCEROS AUKLET.— Estimated number, about 20,000 pairs. The nesting colonies of this species seem to be confined to the eastern side of the main island. On all the slopes in this locality, where the ground is not too wet to burrow in, they are abundant from a few feet above the rocky beaches to four or five hundred feet on the hillsides among the timber. The burrows are generally from seven to nine feet in length, crooked, and often forked two or three times. The burrowing bird tears the earth loose with its bill and throws it backward with its feet. The shallow nest cavity is more or less sparsely lined with grasses and leaves, and additions are apparently made to the nest lining during the incubation period and even after the young is hatched. The egg laying begins the fourth week in May and probably continues far into June, as a bird was found incubating an egg as late as July 22.

The incubating birds are relieved by their mates at about 11 P. M. and 2 A. M., about three hours on the night shift and twenty-one on the day shift. It was, of course, impossible to ascertain whether or not the same bird continues to incubate during the day throughout the entire period, but in this country of long days and short nights, it seems improbable that such should be the case. The birds go considerable distances in search of food and evidently prefer the smooth water of the inside channels to the rougher water around Forrester Island. While they are rarely seen in the latter locality in the daytime, they are abundant in the channels between Prince of Wales Island and Dall and Suemez islands. They begin appearing in small flocks in the vicinity of Forrester Island about an hour before dusk and fly restlessly back and forth from then until dark. On one or two occasions while walking among the nesting colonies in the daytime, I was surprised to see an incubating bird leave the burrow and fly to sea. I do not consider this a regular occurrence, but believe rather that the bird heard my approach and was frightened into leaving the nest.

The Indians' favorite method of capturing these birds is to build a large fire in the nesting colony at the time of night when the birds are changing. They become bewildered by the light and are easily despatched with the aid of long spruce boughs. All auklets and murrelets are eaten by the Indians and are known to them as "little ducks."

Ptychoramphus aleuticus. CASSIN'S AUKLET.— The least common of the burrowing birds. Probably not more than 2000 pairs on the reservation, although this number is a pure guess, as it is impossible to differentiate, from outward appearances, the burrows of this species from those of the

next. Among the total number of burrows excavated, however, the percentage of the Cassin's Auklet was very small. They were found nesting on the east side of the main island and on Petrel Island. Eggs were noted occasionally from May 30 to June 9. On the latter date large young were common on Petrel Island, so the nesting season must have commenced in April. A bird incubating two eggs was found on this latter occasion. It seems probable that one of these was deposited by another bird.

Synthliboramphus antiquus. ANCIENT MURRELET.— Very abundant. Estimated number, 20,000 pairs. The principal nesting colonies of this bird are on the eastern slope of the main island where they mingle with the two species of auklets. They also nest in lesser numbers on Petrel Island among the petrel colonies. From observations it would seem that this murrelet seldom burrows in open ground but prefers locations among roots of trees and under logs and rocks. The nesting season evidently begins about May 1 and continues well into June, the most of the eggs, however, being deposited about May 10 to 15.

The newly hatched young has a greyish band across the chest and the abdomen is also shaded with grey. In two or three days this disappears, leaving the under parts pure white. The young leave the nest when about four days old and follow the parent bird to the water. This movement takes place generally between 11 P. M. and 1 A. M. At this time of night the calls of old and young murrelets may be heard in all directions. At the time of my arrival on the island, May 23, the young were already leaving the nests, and the latest noted was on the night of July 2. They were most plentiful June 1 to 10. The old bird precedes the young to the water, generally keeping from twenty to one hundred feet ahead of it. A continuous communication is maintained between the two, the frequent cheeps of the young being answered by the parent. By the aid of a lantern I was able to watch the progress of this movement. The chicks come tumbling down the hillsides, falling over rocks and logs and, directed by the adult, generally make their way to the bottom of the nearest ravine which they follow to the salt water. Arriving at the water's edge, in response to the anxious calls of the parent who is already some distance out on the water, the chick plunges in and swims boldly out through the surf and joins its parent. Whether or not both young generally leave the nest on the same night, I am unable to state but I know that this is not always the case, as in one or two instances a solitary young was found in a nest, the evidence showing that two birds had been hatched and that one had already left. The young murrelets are easily attracted by light and they often wandered into the tents of the fishermen where, rendered helpless by the glare of the light, they were easily captured.

The old bird with the young evidently proceeds immediately out to the open water as, even when hundreds took to the water at night, they could not be found anywhere in the vicinity of the island the next morning. During the entire summer not a single young murrelet was seen after it had

taken to the water. Like the Rhinoceros Auklets, the old birds were occasionally seen near the shore but in very small numbers compared to the total number nesting on the island. Their principal feeding ground is, seemingly, well out to sea.

Brachyramphus marmoratus. MARBLED MURRELET.— During the early part of the summer this species was not noted in the vicinity of the reservation and I am sure that it does not nest on the island. The first birds were seen July 25, when three adults were found feeding a little distance from shore. One bird taken at this time was an adult female which, according to the condition of the sexual organs, had nested some time previously. After this date the species was further noted on several occasions.

It was plentiful in the channels around Prince of Wales and Dall islands throughout the summer and evidently nests in these localities. Mr. W. D. McLeod, of Howkan, informs me that during late May and the month of June he has observed Marbled Murrelets flying down from the mountains of Dall Island at dusk.

Cepphus columba. PIGEON GUILLEMOT.— Probably 300 pairs on the reservation. Generally distributed along rocky shores, the favorite feeding ground being around the kelp patches close in. This bird has a peculiar habit of sometimes carrying a small fish around in its bill for a considerable length of time before eating it. One bird noted carried the fish for a full two hours, the lower mandible being in the gill and the upper one on top of the fish's head. The nests of the sea pigeon were for the most part inaccessible, being far in the recesses of crevices in the roofs of caves. A nest containing one egg was found June 26. This egg was later destroyed by crows, which are very numerous around the sea bird colonies and prey especially on the eggs of the sea pigeon, cormorant and murre.

Uria troille californica. CALIFORNIA MURRE.— Probably 20,000 pairs nesting on the reservation. The principal rookeries are on the west side of Forrester Island, on Cape Horn Rocks and on Petrel Island. There seemed to be no nests at all on the easterly and more protected side of the island. These birds begin to deposit their eggs about July 20 and probably all the females had laid by August 5. Owing to the destruction of many of the eggs, however, fresh eggs may be found until late in August. This destruction of a considerable percentage of the eggs is due to two causes. First, the thieving crow who finds in the stupid murre an easy victim, and second in the clumsiness of the murres, themselves. Many of the eggs are laid on narrow ledges of cliffs and the clumsy birds when leaving or alighting on the nesting ledge frequently roll the egg over the side of the cliff. During several visits paid to the murre colonies, many eggs were seen thus destroyed. On one occasion an egg dropped seventy or eighty feet and struck on the back of a murre on a ledge below. The first young murre was noted August 13.

Stercorarius parasiticus. PARASITIC JAEGER.— Migrant. Several birds seen near Lowrie Island August 3.

Rissa tridactyla pollicaris. PACIFIC KITTIWAKE.— Common before June 10 and after August 10. Immature birds in the majority.

Larus glaucescens. GLAUCOUS-WINGED GULL.— Estimated numbers. Nesting birds, 3000 pairs; immatures, 10,000 (this does not count young raised this year). This species was nesting scatteringly along nearly the whole coast of the main island and there were substantial colonies on Petrel Island and adjoining rocks and on Cape Horn and Sea Lion rocks. They began laying the first week in June and by the middle of the month the nesting season was at its height. On August 13 large young were the rule, although a few nests containing eggs were noted on that date. The young birds depend a great deal on protective coloration for concealment. On the approach of an intruder they lie absolutely motionless among the rocks and, so perfectly do their colors blend into the gray of the rocks, very frequently escape detection. One youngster, yet unable to fly, fell from a cliff into the water below. Here he was joined by one of his parents who guided him to a sloping rock and assisted him to land.

Larus argentatus. HERRING GULL.— Although this gull has not been previously reported from the reservation, it was found to be fairly common, especially around the rocks at the north end. The immature birds outnumbered the adults, however, at least ten to one. The only place the species was found nesting was on Cape Horn Rocks, where two nests, each containing two eggs, were noted on June 22, the birds being flushed and positively identified in both instances. A few days later these eggs had disappeared, probably having been taken by the natives. It was impossible to estimate the number of herring gulls breeding as their nests could not be differentiated with certainty from those of the last species. From the number of adults noted, the nesting birds probably number about twenty pairs. Immature birds estimated at 400. Total 440.

Diomedea nigripes. BLACK-FOOTED ALBATROSS.— One bird seen near Lowrie Island August 3. I was on a launch at the time and, heading directly toward the bird, succeeded in approaching within fifty feet before it took alarm and flew away, pursued for a short distance by two gulls.

Puffinus griseus. SOOTY SHEARWATER.— Seen occasionally throughout the summer, generally a half mile or more off shore but on one occasion between Forrester and Lowrie islands.

Fulmarus glacialis glupischa. PACIFIC FULMAR.— Frequently seen at a little distance from shore during late July and August. All birds noted were in dark plumage.

Oceanodroma furcata. FORKED-TAILED PETREL.— Probably 10,000 pairs nesting on Petrel Island, seemingly the only place on the reservation where petrels nest. *O. furcata* is outnumbered by the next species at least five to one. Their nesting localities are practically identical, though furcata seems slightly more partial to the grass covered slopes than to the more open ground among the timber. *O. furcata* also nests considerably earlier than the next, eggs being found most plentifully June 5 to 15.

The night of June 10 was spent on Petrel Island. From 10.30 P. M.

FORKED-TAILED PETREL ON NEST (EXCAVATED).

HORNED PUFFIN ON NEST.

until 2 A. M. the air swarmed with petrels of both species. There is a considerable difference in their notes while in the air, and the notes of the white-rumped bird were in a preponderance of about three to one. Many of this latter species were not in the air, however, but were in burrows and in crevices in the rocks in pairs, this being the height of their courting season. Their cooing love notes could be heard emanating from the ground during the entire night.

Oceanodroma leucorhoa kædingi. KÆDING'S PETREL.— The white-rumped petrel of Forrester Island is exactly the same as the bird that nests on St. Lazaria Island, Sitka Bay. In previous articles on the birds of that reservation (Bird-Lore, XIV, 1912, pp. 419–426: Condor, XVI, 1914, pp. 71–91), I referred this petrel to the form *O. beali* described by Emerson (Condor, VIII, 1906, p. 54).

Through the kindness of the authorities of the United States National Museum, I secured for comparison with St. Lazaria and Forrester Island birds a series of nine adult specimens of *O. leucorhoa leucorhoa* from the north Atlantic, six specimens from the Aleutian Islands and Bering Sea and four specimens from near Midway Island, Ter. Hawaii. Also through the courtesy of the Oregon State Game Commission, I obtained twelve breeding specimens of *O. leucorhoa kædingi* from Three Arch Rocks, off the Oregon coast. The following conclusions were arrived at by a careful study of the above mentioned material in comparison with series from St. Lazaria Island and Forrester Island.

Average measurements.	Wing.	Tail
Nine specimens, north Atlantic	6.24	3.45
Six specimens, Aleutians & Bering Sea	6.22	3.14
Twenty specimens, Sitka Bay	6.05	3.04
Twenty specimens, Forrester Island	6.03	3.05
Twelve specimens, Three Arch Rocks	5.98	3.01

From the above measurements it will be seen that the southeastern Alaska birds are much nearer *kædingi* than *leucorhoa*. The birds from Bering Sea and the Aleutian Islands are nearer *leucorhoa* but with a tendency toward *kædingi*. There are exceptional specimens from both St. Lazaria and Forrester Islands that measure nearly as large as the average of *leucorhoa*. For these two latter reasons it would seem that *kædingi* must be regarded as only subspecifically distinct from leucorhoa; therefore I have used the trinomial. The measurement of the forking of the tail which has been extensively used by some writers is very variable. The two races *O. beali* from Sitka Bay, and *O. beldingi* from Netarts Bay, Oregon, described by Emerson (l. c., p. 54) seem to be founded on characters too minute to be worthy of recognition. The birds from Sitka and Forrester Island possibly average slightly lighter on the back and darker on the under parts than specimens from the Oregon coast but in several specimens at hand these differences cannot be detected.

I estimated the number of these birds nesting on Petrel Island at 50,000 pairs. Their burrows were abundant both on the grassy hillsides and on top of the island among the timber. They began laying about June 20 and the nesting season was at its height June 29.

Phalacrocorax pelagicus pelagicus. PELAGIC CORMORANT.— About one hundred pairs of these birds nested on the reservation during the past season and there were probably as many more immature birds that did not nest. The principal nesting colony, consisting of about fifty pairs, was at the northeast end of the main island. Occasional nests were also noted at other points on the main island, on Petrel Island and on Cape Horn and Sea Lion Rocks. The birds were nest building during the entire month of June and the first eggs were noted June 26, on which date one nest contained three eggs, all other nests nearby being empty as yet. A week later nearly all the nests contained eggs. The first young were seen July 22.

At least two thirds of the eggs and young of the cormorants were destroyed by the crows, which were always most abundant in localities where the cormorants were nesting.

Nettion carolinense. GREEN-WINGED TEAL.— A bird of this species shot near camp August 13 and another seen the same day.

Histrionicus histrionicus. HARLEQUIN DUCK.— Occasional throughout the summer. Pair of adults in breeding plumage seen at Lowrie Island June 14. A search for a nest was unsuccessful.

Ardea herodias fannini. NORTHWEST COAST HERON.— One seen at north end of island July 28. Rather common on Dall and Prince of Wales Islands.

Lobipes lobatus. NORTHERN PHALAROPE.— Abundant on the ocean during late July and August.

Ereunetes mauri. WESTERN SANDPIPER.— Single bird seen at north end of island July 15. Common at south end of Dall Island during late August.

Numenius hudsonicus. HUDSONIAN CURLEW.— One seen at northeast end August 13.

Ægialitis semipalmata. SEMIPALMATED PLOVER.— Single bird appeared on the beach near camp the morning of July 31 and remained most of the day.

Hæmatopus bachmani. BLACK OYSTERCATCHER.— About fifty pairs nesting on reservation. Nest containing three eggs noted June 29. Three young about two days old seen the same day.

Summary of breeding water birds.

Lunda cirrhata. Tufted Puffin	70,000
Fratercula corniculata. Horned Puffin	2,200
Cerorhinca monocerata. Rhinoceros Auklet	40,000
Ptychorhamphus aleuticus. Cassin Auklet	4,000
Synthliboramphus aleuticus. Ancient Murrelet	40,000

Cepphus columba. Pigeon Guillemot	600
Uria troille californica. California Murre	40,000
Larus glaucescens. Glaucous-winged Gull	16,000
Larus argentatus. Herring Gull	440
Oceanodroma furcata. Forked-tailed Petrel	20,000
Oceanodroma leucorhoa kædingi. Kæding Petrel	100,000
Phalacrocorax pelagicus pelagicus. Pelagic Cormorant	300
Hæmatopus bachmani. Black Oystercatcher	100
Total	333,640

LAND BIRDS.

Haliæetus leucocephalus alascanus. NORTHERN BALD EAGLE.— Estimated numbers. Nesting birds, thirty pairs. Young in nests, sixty. Immatures of past two years, eighty. Total, 200. At the time of my arrival on the island, May 23, the young were already hatched. They had apparently not yet left the nests August 15. The eagles on Forrester Island seem to subsist nearly altogether on fish, though on a few occasions they were seen in pursuit of sea birds.

Falco peregrinus anatum. DUCK HAWK.— Half dozen pairs nesting. One nest examined June 13 contained two young about two weeks old. Most of the young were flying by July 20 and hunting for themselves by the 25th. This hawk appears to feed entirely on other birds, puffins, auklets and murrelets being its chief prey.

Cryptoglaux acadica. SAW-WHET OWL.— An adult female was taken June 5 as she left a cavity in a dead spruce stub. On examining the cavity, apparently an old woodpecker's nest and about eight feet from the ground, it was found to contain four eggs on the point of hatching.

The species was common at the south end of Dall Island August 25–27.

Bubo virginianus saturatus. DUSKY HORNED OWL.— One of the fishermen reported seeing a horned owl in a thicket at the northeast end of the island July 10. On visiting this locality the following day the bird was not seen, but a feather was found that undoubtedly came from a bird of this species.

Ceryle alcyon caurina. WESTERN KINGFISHER.— First noted August 3, when a bird flew past camp. Single bird seen August 4 and again August 8. Probably a straggler from Dall Island, where it is common.

Dryobates villosus sitkensis. SITKA HAIRY WOODPECKER.— I am rather puzzled as to the exact status of this bird on the island. It was rather common in the woods until the second week in June and after August 1. Between these dates it was very rarely seen or heard. It may have retired to more dense and out of the way sections to nest but no proof of this was obtained. Cavities, apparently old nesting sites of some woodpecker, were noted occasionally but no fresh ones were found. The bird was extremely wild and no specimens were obtained but from geographical reasons it is probable that it is referable to the above form.

Sphyrapicus varius ruber. RED-BREASTED SAPSUCKER.— A single bird seen near camp May 26. For reasons pointed out by Swarth (Univ. Cal. Pub. Zool., 10, 1912, pp. 35–38) I have used the above name rather than *S. ruber notkensis* of the A. O. U. Check-List.

Empidonax difficilis difficilis. WESTERN FLYCATCHER.— Rather common in the woods all over the reservation and undoubtedly breeding, though no nests were found.

Corvus corax principalis. NORTHERN RAVEN.— Common in the timber on all parts of the reservation. I was unable to locate the nest of this bird but it undoubtedly breeds, probably in the dense timber. Fully fledged young appeared with their parents early in July.

Although this bird in outward appearance is very similar to the more southern form, *C. c. sinuatus*, its notes, actions and, apparently, its nesting habits are so entirely different that it is difficult for me to regard the two forms as only subspecifically distinct.

Corvus caurinus. NORTHWESTERN CROW.— Very plentiful, especially in the vicinity of the sea bird rookeries. Two or three nests examined were placed in spruce thickets near the beach. The young left the nests about the middle of July and joined their parents in their egg raids.

This was the one bird on the reservation in which it seemed impossible to see a single redeeming quality. It is a pest and a robber of the worst type. Although possibly doing no more damage, bird for bird, than does the duck hawk, it is much more abundant. It also lacks the speed and fighting qualities of the latter which, however misplaced, one cannot help but admire.

Loxia curvirostra minor. AMERICAN CROSSBILL.— Occasionally seen in small flocks during the early summer, becoming more plentiful about July 20. Whether or not this species breeds on the reservation, I am unable to say. No nests were found and the birds seen were always in small companies, never in pairs.

Spinus pinus. PINE FINCH.— Rare during the early summer, at which season it was noted only on Petrel and Lowrie islands. About July 9 it began to appear in the vicinity of the camp and after July 20 was abundant.

Junco oreganus oreganus. OREGON JUNCO.— During the early summer evidently confined to the scrub timber and open meadows on top of the island. First appeared in the vicinity of camp July 9 during stormy weather, at which time adults and full grown young appeared together. After this date it was common.

Melospiza melodia rufina. SOOTY SONG SPARROW.— Common in grassy locations open to the sunshine, not occurring in the dense woods or more shady portions of the island. Most plentiful on Petrel Island but occurring in smaller numbers in favorable localities on the main island, Lowrie Island and Cape Horn Rocks. The nest is difficult to locate, being placed on the ground and carefully concealed among the grass. It is built entirely of grass, coarse outside and fine inside. One found June 13 contained four newly hatched young, and another found July 22 contained an addled egg and three young just leaving the nest.

Passerella iliaca townsendi. TOWNSEND'S FOX SPARROW.—Probably the most abundant land bird on the reservation, occurring in wooded localities everywhere. Seemingly at least two broods are raised in a season. The location of the nests noted varied greatly, some being ten or twelve feet up in trees, some in brush thickets and on fallen logs and others on the ground. A brood of young left a nest near camp May 24 and fresh eggs were found as late as June 22.

Vermivora celata lutescens. LUTESCENT WARBLER.— Common in brush thickets and on grassy slopes in many different localities. Was evidently breeding during the month of June but no nests were found. In late July the adults appeared accompanied by the young and from that time on the species was very abundant in the young spruce timber.

Nannus hiemalis pacificus. WESTERN WINTER WREN.— Common throughout the wooded sections. Full grown young appeared by June 18.

Certhia familiaris occidentalis. CALIFORNIA CREEPER.— Rare. Seen occasionally in the woods throughout the summer.

Penthestes rufescens rufescens. CHESTNUT-BACKED CHICKADEE.— Fairly common during the first part of the summer. Abundant after July 10.

Regulus satrapa olivaceus. WESTERN GOLDEN-CROWNED KINGLET.— Common. During early summer kept mostly to the treetops, but by the latter part of July was plentiful everywhere.

Hylocichla ustulata ustulata. RUSSET-BACKED THRUSH.— Abundant in the timber in all parts of the reservation. From June 14 to July 2 several nests containing eggs and young were found. The locations of these varied greatly, some being low down in salmon-berry thickets, some in roots of fallen trees and others in crevices in stumps. In nearly all cases the nests were beautifully covered with green moss. Some young birds were flying by July 10 and shortly after that date they were plentiful.

Ixoreus nævius nævius. VARIED THRUSH.— Much less common than the last species but fairly well distributed throughout the timber. Fully fledged young appeared the last week in June.

NOTES ON THE ROCK DOVE (*COLUMBA DOMESTICA*).[1]

BY CHARLES W. TOWNSEND, M.D.

THE two familiar birds of city streets are the European House Sparrow, or English Sparrow as it is generally called, and the Rock Dove, commonly known as Pigeon. Both are equally fearless in the presence of man and all his works, and both are equally dependent on their own exertions for a living, although both are fed more or less irregularly by the passer-by, chiefly for the pleasure afforded by the sight of the crowding, eager birds. The English Sparrow is properly included in most bird lists as an introduced species. The Pigeon, however, is seldom mentioned, because here it is domesticated or was originally introduced in this state and has since become feral.[2] In most cities both here and in Europe it has reverted in plumage and habits to the wild state of its ancestor, the Rock Dove, with the exception that instead of breeding in holes and fissures of rocky cliffs, it now breeds in similar situations on buildings in cities. In small towns and villages the Pigeons are generally owned and fed by individuals, and live in dovecotes. A study of the habits of the unconfined bird as seen in cities in this country, and a comparison of its habits with those of its feral progenitors seems worth while. I commend it to ornithologists living in cities who lament that they have no birds to study.

That the various fancy races or domesticated forms of the Pigeon, some 200 in all, are descended from one species, the Rock Dove, *Columba domestica*, is now well recognized, although it was formerly believed that the chief races were of separate lineage. This is not to be wondered at, when we consider the extraordinary diversity shown, not only in external plumage and form, but also in internal structure by those races, some of which, it is believed, date back to prehistoric times. One has but to glance at a pouter, a carrier, a barb, a fan-tail, a turbit, a tumbler or a trumpeter,

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[1] Stejneger, Proc. U. S. Nat. Mus. X, 1887, p. 424, has shown that Linné's *C. livia* is a *nomen nudum* and that *C. domestica* of Gmelin must be used.

[2] See, however, O. W. Knight, Birds of Maine, 1908, p. 208, and G. M. Allen, Fauna of New England, List of Aves. Boston Soc. Nat. His., 1909, p. 226.

for example, to realize the immense plasticity of the species and the changes wrought by artificial selection through the ages. Darwin showed that all these races, although breeding true, were fertile among themselves, and that the hybrids were fertile; that the young of the different races could hardly be distinguished apart within twelve hours of hatching; and lastly that diverse races and their hybrid offspring when bred together result in Rock Doves, typical in form and plumage.

This same interbreeding has occurred in the flocks of Pigeons seen in our cities. Here the majority of the birds have the general grayish-blue color with iridescent necks and breasts, white rumps, white axillaries and lower wing coverts, two black wing-bars and black terminal or sub-terminal tail bands, typical of the Rock Dove. Albinism is not uncommon in these flocks but irregular plumage is rare, and unusual form is practically never seen. In a flock of 83 Pigeons seen on Boston Common, one bird was a full albino, four partial albinos, three were chocolate-colored and the rest nearly all in the regular plumage. A few of these were darker blue than usual with little or no white on the rumps, and a number more showed slight albinism in the wing feathers, seen only in flight. In a group of 150 birds counted at another time, one was chocolate-colored, 12 more or less albinistic and the rest nearly typical of the Rock Dove.

I am inclined to think that the prevalence of albinism in these Pigeons may be partly accounted for by the fact that there are, with rare exceptions, no hawks in cities to pick off prominently marked birds, for it is reasonable to suppose that a bird, conspicuous through albinism, would afford a more shining mark to a hawk, and would therefore be more subject to capture. This supposition is borne out by an observation related to me by Mr. William Brewster. He brought to his place at Concord a flock of Pigeons, the majority of which were more or less albinistic or else were light chocolate in color, but about one fourth of the flock were in the ordinary plumage of the Rock Dove. The flock was from time to time harried by hawks who killed a number of the birds, and the interesting part is that at the end of some three years the albinistic and chocolate-colored birds were practically all weeded out and the typical blue birds alone remained.

The Rock Dove is common wherever caves or deep fissures exist on the rocky coasts of Scotland and Ireland, in the Shetlands, Orkneys, Hebrides and Faroes. In England, according to Howard Saunders,[1] it is "very local in Devonshire, and only a few frequent the cliffs of Cornwall. It can be traced along the coast of Wales, and at one spot in Cumberland, as well as the Isle of Man, while on the eastern seaboard it is found at Flamborough Head and in Northumberland. Birds,—apparently wild,—sometimes frequent holes in cliffs inland as well as on the coast, but they are open to the suspicion of being partially domesticated individuals which have reverted to a wild state, or descendants of such." In Scandinavia the Rock Dove is rare and local and it is uncommon in the rest of Europe except in the mountains of Portugal, Spain and Italy. Darwin pointed out that as one goes south and east the rump changes in color from white to blue. Hudson [2] says of the Rock Dove: "In its language, flight, and habits it is indistinguishable from the bird familiar to every one in a domestic state." Selby [3] says that it "is never known under any circumstances to affect the forest or perch upon a tree." Saunders [4] says "It has a marked objection to settling on trees — a peculiarity which is still shared by its domesticated relatives." In the British Isles it nests from April to September, and lays two sets of two eggs each.

The courtship of the Rock Dove is the same in our city streets as on wild rocky coasts. It may be seen here nearly every pleasant day from January to December. The male coos long and frequently, and expresses himself in the syllables *coo-roo-coo* or *cock-a war*, the last syllable in either case much prolonged. He stretches his neck now up, now down and, with puffed out breast, displays to full advantage his brilliant iridescent feathers. His tail is spread and scrapes stiffly on the ground and his wings are drooped slightly. At times the amorous bird advances and retreats, pirouettes now this way now that, in order that the meek and apparently indifferent female — actually slightly smaller but now very noticeably smaller — may be duly impressed. At times he makes little

[1] Manual of British Birds, 1889, p. 471.
[2] British Birds, 1902, p. 262.
[3] The Naturalist's Library, Ornithology, 1835, vol. V, part III, p. 147.
[4] loc. cit.

jumps into the air, and occasionally flies a few feet. At times, when not actually courting, he caresses his mate by kissing or billing and at times feeds her with "pigeons-milk." Again the happy pair preen each others feathers and search for tormenting inhabitants in a manner suggestive of monkeys or certain savages.

The fighting that goes on between rival males is an important part of the courtship, a fact that is generally overlooked in poetical accounts of the gentle, cooing dove. These cliff-dwellers on window ledges and projecting copings of high buildings may often be seen engaged in sparring with their wings. Sometimes only one, sometimes both wings are used, and the birds strike with considerable force and swiftness and deliver the blows on each others heads and necks and sometimes push or ward with one wing and strike with the other. The contest is often continued with but little advantage on either side for minutes at a time, but generally results in the weaker — not going to the wall — but being forced away from it off the ledge and having to use his weapons for flight. Sometimes the conquered one returns at once to the fray but often is obliged to content himself with a humbler station and the victor, undisturbed, struts and coos before his shy mate. The fighting is distinctly a cliff performance, with the object of pushing the rival off the ledge. Knight [1] says: "I have seen the fight protracted until one is killed or completely exhausted." On the outer edge of a Pigeon's wing is a bare spot of thickened integument.[2]

The nearest approach to rocky caves in cities are to be found in church towers, and these are favorite nesting sites. Open situations on window ledges and various architectural projections on buildings are, however, freely used. The nest is often built in some of the busiest streets just above the passing wagons, and I have seen one on an iron beam under a noisy elevated car station close to an arc light. The nest is unattractive by reason of the liberal amount of dung with which it is daubed and of which in many cases it is chiefly composed. The walls of the building below and in the vicinity are also spattered. To avoid this disfigurement of buildings the ledges are sometimes built up or covered at such

[1] loc. cit.

[2] vide Lucas. The Weapons and Wings of Birds, Report of U. S. Nat. Museum, 1893, p. 656.

steep angle that the birds are unable to alight, and "pigeon-proof" architecture is spoken of. Besides the dung, small sticks are used in the construction of the nest, and there is generally a scanty lining of feathers. The nests vary in size, but are sometimes built up from repeated use to a height of six or seven inches, and are about fourteen inches in outside diameter.

The number of broods raised by these wild descendants of domesticated birds varies very much and is said to be four, but their eggs may be seen in almost every month of the year. The eggs are two in number and pure white in color, characteristic of the hole inhabiting birds. Incubation lasts about two weeks and both parents take part. The young are covered with loose grayish or yellow down and rapidly grow to full size and attain a plumage very similar to that of the adult. They lack the iridescent feathers and are slightly mottled.

The feeding of the young with the so called "pigeon-milk" by both parents is an interesting phenomenon. The adult thrusts its bill deep down into the side of the bill of the squab, vibrates its wings and works its neck muscles in a pumping manner. The squab, when not actually engaged in the feeding process, waves its wings and calls in beseeching, whistling notes for more. An examination of the gullet of the adult shows a large reticulated glandular crop from which a gelatinous fluid can be squeezed. This secretion mixed with, and serving to digest the contents of the crop forms the pigeon-milk with which the young birds are fed. As the young grow, grain and other food partially digested is given.

The cliff-inhabiting proclivities of our city Rock Doves is shown by their night-roosting habits. Besides church towers, which furnish the caves, the ledges on the buildings are thus occupied. Numerous ledges on the different façades of the Court House in Boston are favorite resorts, as are also the long ledges under the eaves of Arlington Street Church and the window ledges on a building on Tremont Street opposite the Common. Whole rows of birds may be seen sleeping peacefully in these situations amid the glare of electric lights and the noise of traffic in the streets. These night roosts are favorite resting places in the day and are often more or less occupied in dark and stormy weather.

The Rock Dove also shows evidence of its former life among

rocky cliffs by its inherited objection to alighting on trees, although an interesting change has come over it in Boston at least. Thirty-five years ago I noted, as an unusual event, that a Pigeon was occasionally to be seen on the large branch of an elm tree in Louisburg Square. In my notes of March 30, 1906, I say: "Rarely alight in trees, but does so habitually in Louisburg Square, and occasionally a few on the Common." In my notes of February 9, 1907, I find the following: "Twenty years ago it was a rare thing to see a Pigeon alight in a tree; now there are several places where they commonly alight, and I have seen a flock of 50 in a tree in the Public Gardens. There are two places in the Common where these birds are in the habit of alighting. Single birds or pairs are to be seen anywhere in trees." Since then the habit has continued. The tree referred to in the Public Gardens is one with very large branches devoid of fine sprays — a Kentucky coffee tree — and I have lately counted as many as 100 Pigeons in this tree. Almost always trees with large branches are chosen but I have seen Pigeons on small branches or even on telegraph wires. This change in habit is of interest as an evidence of adaptiveness in a species. It would be interesting to know whether the same change is going on elsewhere in this country or in Europe.

The flight of this bird is worth studying and has many points of interest. If one disturbs a single individual or a flock on the ground so that the birds suddenly take flight in alarm, a loud and sharp clapping noise is usually made, apparently by the striking together over the back of the upper surfaces of the wings. Wm. Macgillivray [1] says: "When startled, they rise suddenly, and by striking the ground with their wings produce a crackling noise." The fact however, that the noise begins and continues after the birds have left the ground seems to disprove this observation. In this connection the following observation by Fielden [2] of another charadrioform bird, the Knot, is of interest. He says: "Immediately after arrival in June they began to mate, and at times I noticed two or more males following a single female; at this season they soar in the air like the Common Snipe, and when descending

[1] A History of British Birds, 1837, vol. I, p. 273.

[2] Fielden, H. W., List of Birds observed in Smith Sound in 1875–76, Ibis, 1877, 4 series, vol. I, p. 407.

from a height beat their wings behind the back with a rapid motion which produces a loud whirring noise." As Pigeons that are not suddenly disturbed rise from the ground silently, is it not possible that this loud clapping, made perhaps when the bird is frightened, may subserve a useful purpose in confusing a crouching animal stealing through the grass, and thus prevent its springing at its prey? Be this as it may, it is evident that, as in the case of the Knot, the clapping is at times a courtship action, for, with puffed out neck and breast, a male may fly with loud clapping to alight near a female.

The facts that when well under way in the air Pigeons extend their feet behind under the tail, although they carry them in front for short flights, and that they extend the bastard wing as they glide towards a perch can both be verified by any one with ordinary vision. I have already discussed these points in other papers.[1] It is interesting to speculate that this extension of the bastard wing may point back to the time when the reptilian ancestors of birds grasped with their front extremities the perch to which they were gliding.

The aërial evolutions of a flock of Pigeons are performed with as great precision as is seen in flocks of Shore Birds, Gulls, and Auks, — all relatives of Doves in the group of Charadiiformes. It would seem as if the birds possessed a common mind as each bird in a large flock suddenly turns with military accuracy first its back then its breast to the observer, while the flock sweeps on, now this way, now that, about a church tower. This sudden turning is accomplished by a rotation of the body along an antero-posterior axis through the arc of a quarter to a half of a circle. The flock, flying by an observer with the nearer wings pointed downwards at an angle of 45 degrees below the horizon, suddenly changes so that the nearer wings point upward at an angle of 45 degrees with the horizon. With this change in position or "reverse" the color of the wings appears to change from greyish blue of the upper surface to silvery white of the lower surface. Dewar [2] has studied these evo-

[1] The Position of Birds' Feet in Flight, Auk, XXV, 1909, p. 109.
Bird Genealogy, Auk, XXIX, 1912, p. 285.

[2] Dewar, J. M. The Evolutions of Waders. The Zoologist, 1912, 4 ser., vol. XVI, p. 161.

lutions in shore birds and concludes that they are protective in character, originating in attempts to evade birds of prey and afterwards employed against man. He points out the resemblance to wave movement or sea-spray and believes it to be a case of protective resemblance with the object, not of deceiving the hawk as to the reality of the birds, but of baffling pursuit,— all of which is interesting and suggestive.

At any sudden noise, like the bursting of an automobile tire or an explosion of gasoline in a muffler, a flock of Pigeons will in an instant mount into the air, no matter how busy they may have been in feeding, and fly about for some minutes before they return. A flock of Pigeons roosting on the ledges of the buildings on Tremont Street when startled by an explosion whir away but often return towards the façade only to double back again. Dr. W. M. Tyler has suggested to me that these birds are acting from fear in the same way that their feral ancestors would act if pursued by an eagle or hawk. Edmund Selous[1] says of the wild birds: "In effecting their numerous escapes, the face of the rock stood them in good stead, and they deliberately made use of it, in my opinion, for, dashing in and out, they would cling to it or double against it in places where eagles, as larger birds, could not follow them so deftly, and had perforce to check their speed." Of course the explanation may be, as Dr. Tyler also suggested, that the birds, about to return to their perches, are driven away again and again by the recurring fear. When so engaged in flight, if a second explosion occurs, the whole flock suddenly drops or darts down a few feet while still continuing its rapid course. One cannot help thinking of the similar actions of Shore Birds at the discharge of a gun. I have seen a flock of Black-bellied Plovers dart down in its flight when a gun was fired in another direction some distance off, and, no doubt, under similar circumstances a poor marksman has believed his shot had entered the flock and has wondered that no birds had fallen. The very loud automobile discharge near at hand would naturally startle any bird, but I have seen a flock of Pigeons act in a similar way when the explosion was so distant that it was but faintly heard. One could build up a fanciful theory to the

[1] The Bird Watcher in the Shetlands, 1905, p. 158.

effect that this action of the Pigeons was inherited from ancestors who were pursued by gunners, but this would involve the inheritance of an acquired trait that had existed during the brief time only since gunpowder was used. On the other hand it is possible that the habit has been continued by example from adult to offspring since the feral days of this bird. I have observed a somewhat similar case where a caged canary, not easily disturbed by ordinary affairs of the household, showed great terror whenever a toy balloon floated about the room. This perhaps points back to the more deep seated instinct of fear of a hawk or other large bird hovering overhead. It may be mentioned here that the Pigeon has not yet learned to estimate accurately the speed of an automobile approach. It is able to take care of itself where horses are concerned, but not infrequently lingers too long in the street and is run over or hit by the automobile while it is attempting to fly away. In this respect it resembles the domestic fowl and other animals.

In gliding either in a straight line or in curves and partial circles the wings are held as in most birds about on the same plane with the body, but at times one may see a pair of birds gliding through the air with the wings held up at an angle of forty-five degrees. This is an interesting sight and is apparently of the nature of a nuptial performance.

In alighting in a field the Pigeon frequently first circles over the ground, or, if alighting suddenly, sometimes looks about for a moment before searching for food. This is suggestive of inherited caution from wild ancestry, for the Rock Dove in its native haunts is said to be very wild and suspicious. This caution is not seen when the bird alights in a crowded street.

The typical "dove-like" walk of this bird is familiar; he advances with nodding head as if at each step his head lingered behind while the neck and body kept on. This is seen in a greater or lesser extent in various other birds that walk; it is noticeable in the Ipswich Sparrow.

The sight of a flock of Pigeons sunning themselves on a roof is a familiar one; the birds also have a habit in intervals between feeding of collecting in compact flocks and squatting close together with the tarsi and often the breasts flat on the ground. A group acting thus, all headed towards the wind, suggests the similar habit of Gulls.

I have referred in another paper [1] to the duck-like actions of a fifteen day old Pigeon when put in a tub of water and its bearing on the relationships of this bird to Gulls and Auks. Saunders [2] says "both wild and tame Pigeons have been seen to settle on the water like Gulls and drink while floating down stream." Mr. Wm. A. Jeffries tells me that he once saw a Pigeon alight on the surface of the Frog Pond in Boston Common. I have seen a Pigeon hovering above Charles River in Cambridge dropping its feet till they touched the water, and picking up something with its bill. This was repeated five or six times. This last named action points to the progressive or adaptive character of the bird and not necessarily to its aquatic ancestry, for I have observed similar actions in picking up food from the water on the part of such dissimilar passerine birds as Bronzed Grackles, Cedar Birds and Swallows.

The English Sparrow is the only bird with which the Pigeon is intimately and constantly associated. As a rule no notice whatever is taken by the larger of the smaller bird or *vice versa*, and both feed amicably on the same ground. On rare occasions, however, I have seen an English Sparrow pursue a Pigeon. Once I saw a Pigeon closely pursue a Belted Kingfisher as it doubled back and forth three or four times over the Frog Pond on the Common.[3] In Boston I have known Crows to inflict considerable damage on the eggs and squabs of Pigeons in the rookery of the tower of Trinity Church, and a Duck Hawk feasted daily on adults from his perch on a Commonwealth Avenue church steeple, until a sportsman shot him from his attic window.

In drinking water the bill is held in the pool continuously for half a minute or more at a time, an action very unlike the sipping and holding the head up of gallinaceous birds with which Pigeons were formerly classed. Shore birds when feeding often hold the bill immersed and probably drink at the same time. I have no notes on the drinking of Auks, but I believe that Gulls drink continuously in a similar manner.

In feeding on grain scattered in the street or in horse droppings Pigeons do not scratch. On ground planted with grass seed they

[1] Bird Genealogy, loc. cit.
[2] loc. cit.
[3] Birds of Essex County, 1905, p. 223.

chop vigorously at the ground with their bills causing the earth to fly and making in some cases holes of considerable size. In a garden where numerous strings were stretched which kept away the crows, the Pigeons alighted without fear in the network and chopped holes in the ground to obtain the seeds. On weedy lawns and fields flocks of Pigeons often alight, spread out and systematically eat the weed seeds. Saunders [1] says of the wild birds that they make amends for their fondness for grain by eating weed seeds and the roots of the conch grass (*Triticum repens*). I have seen Pigeons walking along ploughed furrows picking up and eating earthworms and various larvæ exposed. Dr. Glover M. Allen tells me that a few winters ago after a heavy snow fall he observed Pigeons clinging to the Japanese ivy vines on University Hall in Cambridge eating the ivy berries and Mr. Charles F. Batchelder reports seeing a Pigeon perched in a privet bush eating the berries.

On Boston Common it is the custom of visitors to feed the Pigeons with bread crumbs and grain as is done at St. Marks in Venice and at various other cities. The birds flock about in great numbers and alight on the hands, shoulders and heads of the feeders. This familiarity does not necessarily point to the former domesticated state of this bird, for in the same place grey squirrels respond to feeding by nuts in a similar manner, and fearlessly clamber over their benefactor, and investigate his pockets to the astonishment of the rustic visitor, who is familiar with the same animal only at a long gun-shot range. This and the photographs shown us by such men as Harold Baynes point to the millennium for the bird lover when the gun shall have vanished and live birds be treated by everybody as real friends.

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[1] loc. cit.

SHIP CANAL (BUFFALO BAYOU) A FEW MILES EAST OF HOUSTON, TEX.

MIXED OAK AND PINE WOODLAND ON BUFFALO BAYOU, WEST OF HOUSTON, TEX.

ON THE NESTING OF CERTAIN BIRDS IN TEXAS.

BY GEORGE FINLAY SIMMONS.

Plates XXI–XXII.

THE following notes are from observations made by the writer in the southern portion of Harris County, Texas, during the breeding seasons of 1910, 1911, 1912, 1913, and 1914.

The area under consideration is in the southeastern part of the State, and lies wholly within the semitropic or Gulf strip of the Austroriparian zone. Thus we find a slight intermingling of birds of unquestionable tropical affinities with a preponderance of Lower Austral species.

Houston, where nearly all of the observations were made, is about 50 miles northwest of Galveston, which lies on the Gulf of Mexico. Buffalo Bayou runs eastward through the city 28 miles to Galveston Bay; Bray's Bayou skirts the city on the south and joins Buffalo to the east. Each of these streams is skirted on either side by heavy strips of timber, varying from a quarter to a half mile in width. This timber is mostly pine, with a general sprinkling of deciduous trees. Northeast and north of Buffalo Bayou the great southern pine woods begin, and here on these bayous we find the most southwesterly extension of such forests.

The country between Buffalo and Bray's Bayous and south of the latter is typical flat, open and almost level coastal prairie, with little vegetation and few farms or ranch houses. Sprinkled about this prairie are numerous grass-grown ponds and marshes.

The majority of the records are from two sections; the first is a narrow strip of country extending west from the city, about a mile wide, and having Buffalo Bayou as its northern boundary; the second is an expanse of prairie within a mile's radius of Pierce Junction, a small flag-station 6½ miles south of Houston. The woodland records are from the first, while the prairie and marsh records are from the second. All distances are in miles from the flag-station at Pierce Junction and the county court house in Houston.

Little time could be spared during the breeding season to search for nests and eggs; hence the notes are by no means as complete as might be desired. Excessive rains often made it impracticable to go afield during that period, for so level is the country that for weeks after a rain water stands in the woodlands and on the prairies. Though over 50 miles from the Gulf of Mexico, Houston's altitude is but 53 feet.

With few exceptions, the notes were all taken on short afternoon walks within a few miles of the city. But as there are few nesting records for the eastern half of Texas, an expanse of territory comprising over one twenty-fifth of the United States, I feel that I am justified in publishing the more interesting of these notes in order to settle the question of the breeding of certain species in that region.

Anas fulvigula maculosa. MOTTLED DUCK.— On April 17, 1911, Captain Patrick Daly of the Houston Fire Department, while out hunting plover on the coastal prairie about a mile southeast of Pierce Junction, and driving about in a small wagon among a number of small prairie ponds, frequently mentioned in the following notes, flushed a female of this species from a nest containing eleven eggs. As is the case with all ponds in this section of prairie, the whole with the exception of a small spot near the center was thickly covered with tall grass, rushes, water plants of various sorts, and sprinkled with a few bushes or reeds, locally known as 'coffee bean' or 'senna.'

The nest itself was placed about eight inches up in thick marsh grass and rushes, over water four inches deep, and was neatly hidden by the tops of the grasses and rushes being drawn together over the nest. It was but two or three inches thick, a slightly concave saucer of dead, buffy rushes and marsh grass, supported by the thick grasses and by two small 'coffee bean' reeds. The lining was of smaller sections and fragments of the rushes and marsh grass, and a small quantity of cotton; and the eleven eggs were well, though not thickly surrounded by down and soft feathers, evidently from the breast of the parent.

From its resting place in the tall marsh grass in the neck of the prairie pond, Captain Daly transferred the nest and all the eggs to his wagon, and after covering them with a sack drove for three or four hours over the uneven ground. In the afternoon he drove back to the city, leaving the eggs at a farm house about four miles from the ponds. They were then placed under a setting hen and ten young hatched.

Then came the problem of feeding them. At first they were placed in a pen where they could have both sunlight and shade, a pan of water

and a little sand, while for food a quantity of common corn chops was thrown to them. But it was soon found that they would not touch chops; so numbers of small, tender angle worms were taken, cut into sections about a quarter of an inch long and thrown into the water where the downy young ducks could reach them. These were eagerly devoured, as was boiled rice, but before this menu was arranged six of the young *maculosa* departed this life. Three of the remaining four lived to become full-fledged adults, and are alive and healthy at the time of the writing of this note.

Another, and probably the best method of feeding the remaining young was to place in their pen a stale soup bone which drew large numbers of flies. These the young eagerly caught and devoured, soon waxing fat and luxuriant.

Ixobrychus exilis. LEAST BITTERN.— Prior to the breeding season of 1914 I had recorded but few specimens of this rare summer resident, and had never found a nest.

On May 30, 1914, while splashing through the small, marshy prairie ponds about a mile southeast of Pierce Junction, and searching hopefully for nests of the Mottled Duck and Louisiana Clapper Rail, I saw one of these birds fly up from the reeds ahead of me. It was some time before I could locate the nest, for it was evident that the bird had gone some distance through the rushes before taking wing.

But when I did find it I was fully repaid for my search, for it contained five eggs. The nest was supported by several rushes, dead reeds and the broken stem of a small persimmon sapling growing in the pond. At this point the reeds and rushes were not so thick, and the nest and eggs could easily be seen at a distance of fifteen or twenty feet. The bottom of the nest just touched the water, which was there about eighteen inches deep.

The nest itself was quite firmly built, with few loose ends projecting from the mass. It was built entirely of straight stems and twigs of a brushy reed which grows about the ponds, quite different from the flexible reeds and rushes used in the construction of the nests of the other water birds of the region. It measured about six and a half inches across the top and five inches high, being cone shaped and tapering towards the bottom. So flat was the top of the nest that it seemed the slightest jar would cause the eggs to roll off, for there were no rushes or grasses to guard the sides of the nest as in the case of the Rails and Gallinules.

The five eggs were of a pale, bluish white color, much paler than other eggs of the Least Bittern I have examined. They were well incubated, and measured: 1.19 × 89; 1.18 × .90; 1.18 × .89; 1.17 × .90; and 1.15 × .88.

On the same day, but in another of the small ponds or sloughs, I found a second nest of this bird, which contained nothing but shells and fragments of shells to show that the young had already left the nest. It was built of the same rusty, inflexible twigs used in the first nest.

On June 6 I made another trip to the pond last mentioned, and discovered a third nest, similar to the first two, a nest that I had doubtless overlooked in my hurried search of the previous trip. This nest was wider but not so thick as the others, and was resting on several water plants of the lily family, almost flush with the water. It was well hidden by thick reeds and grasses, and had apparently already been used.

Ionornis martinica. PURPLE GALLINULE.— A fairly common summer resident about the marshy ponds of the open coastal prairie, but I never found a nest until the season of 1914.

May 30, in the same pond with the nest and five eggs of the Least Bittern, I flushed one of these Gallinules from a nest containing five well incubated eggs. The nest itself was about eight inches in diameter, three and a quarter inches thick, and about ten inches above the water. It was placed in an isolated clump of rushes on the edge of the open water at the center of the pond, the water at that point being about thirty inches deep.

The living tules or rushes of the clump composed about half of the nesting material, the stalks being broken and bent over and the nest resting on these. The nest was composed of buffy rushes, loosely woven into a slightly concave mass.

The five eggs measured: 1.60 × 1.10; 1.53 × 1.08; 1.52 × 1.08; 1.50 × 1.07; and 1.47 × 1.09.

On this trip, as well as on the next (June 6), I carefully searched all of the ponds in the vicinity, and found several nests that had already been used, as well as numbers of platforms that were evidently 'shams.' In one pond in particular, I found at least ten of these platforms about ten feet apart; they were all formed by the tops of the saw grass and rushes being bent over or broken and interlaced. From the fact that each of these platforms was stained by the white excreta of the bird, I am led to believe that the birds use them as perches during the night so as to be safe from the depredations of the smaller mammals inhabiting the region.

Gallinula galeata. FLORIDA GALLINULE.— But once have I found a nest of this Gallinule. On May 28, 1910, while examining a number of nests of the Florida Red-wing in the tall reeds and grasses on the edge of a lagoon in the San Jacinto bottoms, adjacent to Galveston Bay, I observed a platform of grasses and reeds about six inches in height. There the water was about a foot deep, while the grasses and rushes grew nearly as high as one's head.

Seeing this platform set me to searching and I soon found several more, all empty. And then, as I was about to give up the search, I flushed the Gallinule from a clump of tall rushes and grasses. The nest was cunningly concealed over but three inches of water, and built up ten inches above it; a slightly concave mass about nine and a half inches in diameter and four inches thick, and loosely composed of rushes, reeds and saw grass. It was entirely surrounded by reeds, with but one open side. Since that date I have never returned to the locality.

The six eggs in this nest measured: 1.77 × 1.27; 1.76 × 1.26; 1.75 × 1.25; 1.73 × 1.26; 1.72 × 1.27; and 1.67 × 1.23.

Numenius americanus. LONG-BILLED CURLEW.— On June 1, 1910, in company with Messrs. H. G. Hill and E. G. Ainslie, I came on a marshy pond near Almeda station, thirteen miles south of Houston. Through the tall reeds and rushes we could see a number of birds on a short stretch of silt between the reeds and water on the far side of the pond, and decided to investigate. By crawling slowly through the tall grass and reeds we were able to approach within about twenty yards of the birds before they saw us. There were three adult Long-billed Curlew and seven smaller ones, almost fully fledged but barely able to fly.

The actions of the adults were especially interesting. Often one would spring into the air for a few feet, circle the pond, and relight on the silt. At other times it would merely spring into the air for a few feet, flap its wings several times and then alight, raising its wings over its back as it did so, and then refolding them.

Finally, as one of the adults flew up and circled the pond, it observed us as we lay at full length in the tall grass. At the sound of the hoarse, noisy alarm call the whole flock took wing and flew about a hundred yards, disappearing into the tall marsh grass. As I had expected, the flight of the smaller birds was exceedingly labored and heavy. After giving the alarm, the adult circled the pond again and followed the flock.

The number of birds puzzled me greatly. It is not unlikely that this flock was composed of two families, the younger birds being doubtless reared somewhere in the near vicinity.

Colinus virginianus virginianus. BOB-WHITE.— During the five breeding seasons covered by this paper I found but two nests of this fairly common resident.

The first, May 26, 1912, contained thirteen eggs, the nest being under the edge of a bale of hay in an old shed on the prairie not far from a ranch house about a mile southeast of Pierce Junction. Entrance on the north side of the bale, with the cavity of the nest slightly sunk in the ground; well lined with dead grasses. Nest quite difficult to locate and only found by flushing the bird.

The second, July 20, 1912, contained ten heavily incubated eggs. The nest was skilfully concealed in a small tangled clump containing a blackberry vine, several weeds and several thick tussocks of prairie grass, in a weedy old pasture on the edge of the pine woods, about four and a half miles west of the city. The pasture was sprinkled with such small thickets as the one that contained the nest. The nest was but fifty feet from the edge of the timber, where the pine woods were encroaching on the prairie. The nesting cavity was well arched, sunk slightly in the ground, and faced the east.

The following day, on visiting the nest, I found all of the eggs broken and scattered about in front of the thicket, perhaps the work of the parent itself, or, what is more likely, the work of some four-footed enemy.

The cavity was five and a half inches from side to side, and five inches from top to bottom; it was well lined with dry grasses.

The set containing thirteen eggs yielded the following: 1.25 × .95; 1.25 × .94; 1.25 × .94; 1.25 × .94; 1.24 × .95; 1.24 × .95; 1.24 × .95; 1.22 × .93; 1.21 × .94; 1.20 × .94; 1.20 × .93; 1.19 × .94; 1.19 × .92.

Tympanuchus americanus attwateri. ATTWATER'S PRAIRIE CHICKEN.— Not uncommon as a resident in the wilder portions of the prairies, but I have never found a nest. On June 7, 1913, at Aldine, a station eleven miles north of Houston, two adults and twelve downy young were observed by the side of the railroad track.

Meleagris gallopavo silvestris. WILD TURKEY.— I know of but one nest of this scarce resident for the region under consideration. On May 8, 1912, a farmer by the name of Whicker found a nest by the side of a log in the bottom woods near Penn City, thirteen miles east of Houston. The seven eggs were placed under a domestic hen, and five puny young hatched. They lived but a few days.

Zenaidura macroura marginella. WESTERN MOURNING DOVE.— Common resident in all open country. As I have found dozens of nests, general descriptions would be best.

The nests I have found on the ground, in low bushes and trees, and as high as sixty feet in tall pines. They are usually placed about six feet from the ground on the lower limbs of pine trees along the edges of the woods, in huisache trees on the prairies, in the post oak trees of the scattered motts in the open country, and in the shade and orchard trees around ranch houses. When they are placed in pine trees along the edges of pine woods, the nests are nearly always composed entirely of dead pine needles. When in trees on the prairies, the nests are shallow saucers of straws and dead grasses.

With only one exception, each nest contained two eggs. On May 21, 1911, a nest was found on the horizontal limb of a pear tree in a deserted pear orchard; it contained three eggs. One nest contained two eggs which were quite small, measuring: .98 × .54 and .97 × .50. The largest measured 1.17 × .89, and the average of a large series is 1.10 × .80. The nesting season extends from April 16 to July 20, though the majority of nests are found in latter April and early May. Only a few pairs rear second or third broods.

Chæmepelia passerina passerina. GROUND DOVE.— My only record for the occurrence of this bird and my only breeding record are one and the same. On June 1, 1910, I flushed a bird from a nest containing two young nearly ready to leave the confines of their birthplace. The nest itself was hardly a nest at all, for it was only a slight hollow in the ground, amid the short grass and stubble on the edge of an orchard on the prairie near Almeda, thirteen miles south of Houston, and lined with only a few tiny grasses and hairs.

Buteo lineatus texanus. TEXAS RED-SHOULDERED HAWK.— A common resident for so large a bird, but the nests are generally in such tall pines as to be practically inaccessible. Of the many nests I have found, and of the few I have been able to reach by climbing, I have found but one that was occupied.

BETWEEN THE PRAIRIE AND THE TIMBERLAND, COASTAL REGION NEAR HOUSTON, TEX.

OPEN PINE WOODS ON BUFFALO BAYOU.

On April 29, 1911, I found the nest when it contained two downy young only a day or two out of the shell. The nest was placed about thirty feet up in a small pine tree in the woods on Buffalo Bayou about eight miles west of Houston. It was a well-constructed domicile, and had evidently been used for several seasons. It was a mass of sticks, dead leaves and Spanish moss twenty-four inches high, in a crotch formed by three branches of the main trunk of the tree. It measured twenty-one inches across the top; and the cavity, which was three inches deep, was neatly lined with quite a quantity of fresh, green and fragrant pine needles.

Seven days later (May 6) the young were slightly larger, and the sheathed tips of the primaries were beginning to appear. And on May 14 they faced me with snapping beaks and showed a strong desire to claw me. Both were gaining in strength and size day by day, though one of the birds appeared smaller and more timid than the other. The tips of the primaries had appeared.

On May 27, the last day I was able to visit the nest, the young were nearly as large as the parents. With the exception of their heads they were apparently fully feathered. Their heads had a rather mottled appearance, caused by the feathers appearing amid the grayish down. Undoubtedly they would leave the nest in a day or two.

On the various trips I made to the nest, I found beside the young the remains of their food: small snakes, frogs, and on one occasion the remains of a bird, a male Louisiana Cardinal (*C. c. magnirostris*).

The other nests which I located were all in pines, from forty to eighty feet from the ground, generally in open pine woods with little underbrush.

Haliæetus leucocephalus leucocephalus. BALD EAGLE.— Very rare resident, inhabiting the wilder country around Galveston Bay. I was shown a young bird which was taken from a nest in the bottom woods on Taylor's Bayou not far from the bay, and later viewed the nest, a massive structure seventy feet from the ground in an immense pine. This nest was destroyed by a violent storm in the latter part of 1911. Another nest has been reported to me from the north side of the bay, but I have not had the time to visit the locality and investigate.

Otus asio mccallii. TEXAS?[1] SCREECH OWL.— April 5, 1913, in the woods on Buffalo Bayou about four and a half miles west of Houston, I found a nest in a natural hollow of an elm tree standing on the slope of the bayou; it contained four eggs, incubation far advanced. The entrance to the cavity was nine feet from the ground at a bend in the trunk of the tree; from the bend the cavity extended almost vertically down into the heart of the tree, about thirty inches deep and six inches in diameter; trunk of tree about ten inches in diameter. Only a few leaves and grasses, with a slight lining of feathers, were between the eggs and the bottom of the cavity. It was some time before I could force the female to leave the nest;

[1] *Cf.* Ridgway, Robert. The Birds of North and Middle America. Part VI, p. 694, footnote *b*.

poking her with a stick had no effect other than to make her snap her mandibles, so I was forced to use a hook and pull her out by the neck.

These four eggs measured: 1.32 × 1.16; 1.31 × 1.12; 1.30 × 1.19; and 1.30 × 1.17.

Coccyzus americanus americanus. YELLOW-BILLED CUCKOO.— May 17, 1914, I found my only nest of this fairly common summer resident. It was placed on the horizontal limb of a young pine on the edge of the Buffalo Bayou woods four miles west of the city, and contained three eggs. The nest was a slight platform about eleven feet up, through which I could see with ease; it was composed of small pine twigs, about an eighth of an inch in diameter and averaging six or eight inches long, and was much more concave than I had expected. This shallow saucer was neatly, though quite thinly lined with a few pine needles, a small quantity of Spanish moss and several tiny buds.

A week later I visited the nest and found that some bird, presumably the rightful owner, had pecked a hole in one of the eggs and the nest was deserted. The three eggs measured: 1.22 × .93; 1.20 × .94; and 1.20 × .92.

Ceryle alcyon alcyon. BELTED KINGFISHER.— On May 28, 1910, I made an investigation of the sand banks along the south side of the Houston ship channel (Buffalo Bayou) about six miles east of the city, bent on finding the burrow of this bird, for on several occasions I had observed individuals during the breeding season in that section. There the banks were almost vertical, from eight to ten feet high, and had a narrow shelf between their base and the water's edge.

Several old tunnels were located, but as they were nearly all covered with spider webs I passed them by. Finally, after walking and scrambling about a half mile along the base of these sand banks, I came to a likely looking hole about seven feet up and about a foot and a half from the turf of the solid ground above. Several old roots offered footholds, and I was soon peering into the cavity; with the aid of a mirror I ascertained that the tunnel did not curve, and that it contained eggs. I did not attempt to dig them out, but used a make-shift hoe (a piece of wire bent on the end of a stick) and by careful work dragged out the eggs, six in number, together with a small amount of rubbish on which they were laid. The parents did not appear until I had already secured the eggs.

This set of six measured: 1.35 × 1.08; 1.35 × 1.02; 1.33 × 1.09; 1.33 × 1.08; 1.32 × 1.09; and 1.30 × 1.07.

Dryobates borealis. RED-COCKADED WOODPECKER.— In a certain section of the pine woods on Buffalo Bayou, about eight miles west of Houston, I had occasionally noted Red-cockaded Woodpeckers, and was convinced they nested in that locality. But it was not until May 25, 1912, that I had an opportunity to thoroughly investigate the locality.

I had spent several hours searching before I saw the bird, clinging to the side of a dead pine in a small clearing densely covered with thickets. And by the side of the bird was a likely looking hole. On my approach the bird

left the tree, and during the time I was at the nest stayed a considerable distance away, now and then uttering its short, shrill note.

I had some difficulty in reaching the base of the tree; but to climb the twenty-one feet to the cavity was the work of a moment. Removing the front, I found the eggs to be two in number, nest stained and well incubated, and laid on a small quantity of pithy pine chips.

The two eggs measured: .91 × .69 and .87 × .69.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.— During the seasons covered by this paper I located several excavations of this Woodpecker, but the majority were in dead pines too large and unsteady to attempt to climb. It was not until May 27, 1912, that I located a cavity containing eggs. The birds had selected a dead pine on the edge of a patch of timber by the side of a railroad track on the southern edge of Houston, and thirty feet from the ground had chiseled a domicile. The pine was quite rotten and swayed dangerously, but the bird did not leave the nest until I was within four or five feet of the cavity. Three eggs, evidently fresh, formed the set. Two days later I returned with a companion, this time bent on chopping into the cavity, but found that the eggs had disappeared.

Colaptes auratus auratus. FLICKER.— This Woodpecker is quite rare in Texas, and the only previous nesting record I can now recall is that of J. A. Singley from Lee County.

During June of 1911 I was encamped at Sylvan Beach, on the shores of Galveston Bay, about twenty-eight miles east of Houston. On the 11th, while crossing the picnic grounds, I was extremely surprised to observe one of these birds. I followed it to where it lit on a sweet-gum tree near the pavilion, noting that there was a hole in the stub of a branch broken off close to the trunk, about twenty-five feet from the ground.

The next day, June 12, I returned, climbed to the cavity, and removed a section from the front. The cavity was only ten inches deep, but was quite roomy, and contained seven slightly incubated eggs, nest stained and laid on a few chips from the rotten limb in which the nest was situated.

The set yielded the following measurements: 1.20 × .88; 1.19 × .87; 1.18 × .86; 1.18 × .83; 1.15 × .86; 1.14 × .80; and 1.12 × .85.

Chordeiles virginianus chapmani. FLORIDA NIGHTHAWK.— Though this species is a common summer resident on all the open prairies, and evidently breeds commonly, I have but once found its egg. On June 4, 1913, about a hundred and fifty yards east of the flag-station at Pierce Junction, I flushed a Nighthawk from a single egg on a bare, hard-baked spot on the open prairie, several miles from the nearest timber. Returning a few days later I found that the egg had disappeared.

Myiarchus crinitus. CRESTED FLYCATCHER.— A not uncommon summer resident in the vicinity of Houston. In May, 1911, a pair of these birds occupied the joint and elbow of a stove-pipe hanging loosely by wires against the side of a small house on the edge of the Buffalo Bayou woods about six miles west of Houston. On the 20th I took a stepladder and

climbed up to investigate, causing the birds to desert the nest. Later the pipe was taken down and cleaned out, and the nest found to contain three eggs. The nest itself was a mass of rubbish of all sorts: cedar bark, twigs, grasses, feathers, pine needles, and dead leaves, and was lined with horse hair, feathers and cast off snake skin.

I found another nest of the bird on June 6, 1914, which contained five eggs. An old lard bucket lying on its side in a tiny trough in a well shaded sheep-pen on Taylor's ranch had been half filled with rubbish of various sorts: grasses, cedar bark, snake skin, straws, chicken and guinea feathers, etc., and the eggs had been laid in a hollow in the material near the back of the bucket. To me this nest was especially interesting from the fact that Taylor's ranch is on the open prairie about a mile south of Pierce Junction, and at least four miles from the nearest timber. Quite a number of shade trees surround the house and sheep-pens, but I never would have expected this Flycatcher at such a place.

The five eggs measured: .98 × .67; .94 × .67; .91 × .68; .90 × .67; and .89 × .68.

Cyanocitta cristata florincola. FLORIDA BLUE JAY.— Though this bird is a common resident, I have found but two nests, one of which was accidently destroyed before the eggs were laid.

The other was discovered May 6, 1911, by watching the birds carry mud to be used in its construction. I did not climb to the nest until May 14, thinking the birds were still building the nest, and hence was surprised to find that it contained three eggs very heavily incubated.

The nest was forty-eight feet from the ground, on a three-inch limb about six feet from the trunk of the pine tree in which it was situated, and was composed of twigs and a little Spanish moss, plastered together with wet clayey mud, and lined with rootlets. The birds were quite shy and quiet, in sharp contrast to their conduct at other times of the year. This nest was about a hundred yards north of the house where my first Crested Flycatcher's nest was found.

These three eggs measured: 1.07 × .81; 1.05 × .79; and 1.04 × .81.

Sturnella magna argutula. SOUTHERN MEADOWLARK.— During the breeding season these birds are quite common on the prairies, but their nests are very difficult to discover and it was not until the season of 1914 that I was able to locate even one.

It was on May 30, 1914, that my first nest was discovered. I was walking slowly across the grassy prairies about a mile north of Pierce Junction, when the bird flushed from almost under my feet leaving its arched or domed nest and four heavily incubated eggs for my inspection. The nest was cunningly concealed in a small clump of grass on a slight knoll, and was thus several inches above the surrounding surface, which was under water from the recent heavy rains. The nest inside measured four inches from side to side, four inches from front to back, three and a half inches from top to bottom, and the entrance was four and a half inches across. The specks on the eggs were all grouped at the extremity of the larger end.

June 6, 1914, I was shown a nest in a small pasture back of Taylor's ranch house, a mile south of Pierce Junction. It was exactly similar to the one above described, but faced the west where the first faced the north. It was in a small tussock of grass on the closely cropped surface, and contained three young fully fledged.

On June 11, I flushed a female from another domed nest on the prairie, a half mile north of Pierce Junction. The nest was well concealed under a tussock of grass, slightly sunk in the ground, well lined with dry grasses, and contained four fresh eggs.

Set No. 1 measured: 1.20 × .82; 1.10 × .80; 1.04 × .81; and 1.03 × .78; while the eggs from nest No. 3 yielded the following: 1.11 × .79; 1.10 × .79; 1.09 × .77; and 1.06 × .76.

Passerherbulus maritimus sennetti. TEXAS SEASIDE SPARROW.— Not an uncommon resident in the salt marshes near the bay, but I have only once recorded the bird in the vicinity of Houston.

June 1, 1910, found Messrs. Howard G. Hill, E. G. Ainslie and myself walking southward from Houston across the open coastal prairie. A half mile north of Pierce Junction we stopped at a small marsh to check off a few of the more common species on our list, and in tramping through the rushes and tall grass I flushed one of these Sparrows from a nest on the moist ground in a clump of the thick grass. The nest was composed of coarse dry grasses, lined with finer, and contained three well fledged young. The nest was not a domed structure, but was more on the order of the nests of the Florida Red-wing (*Agelaius phœniceus floridanus*) which surrounded it, for some of the nesting material was entwined about the stalks of the grass. Inside, the nest measured two and a fourth inches in diameter by one and a half deep. Both parents were present, and though nervous were not at all shy, for they often approached within three or four feet of us, perching for a moment on one reed and then on another.

Peucæa æstivalis bachmani. BACHMAN'S SPARROW.— On April 25, 1914, Mr. George B. Ewing (my companion on some hundred-odd field trips) came to me with the information that he had that morning found a nest the like of which he had never seen. In company with a party of surveyors in the woods about nine miles east of Houston and two miles north of Buffalo Bayou, he was tracing a line through the timber when he discovered the nest with three eggs under a small brushy sage-bush in a clearing.

We visited the locality, and though several of the birds were observed, the first nest was the only one found. The nest was *not* arched or roofed over, as I had read in the manuals, but more perfectly fitted the description of the nest of the Pine-woods Sparrow. It was perfectly round, with the rim everywhere of equal height, and was set down on the ground amongst the short grass and stubble. It was a well-constructed nest, composed entirely of dry grasses, and was lined with fine grass tops and a few long horse hairs. As it lost its shape on being carried back to the city in Ewing's knapsack during the afternoon, I was not able to take its measurements.

Although the day was misty and rainy the nest and eggs were quite dry in the shelter of the bush, so that an arched nest would not have helped matters to any considerable extent.

After being emptied of their contents, the eggs lost their faint pinkish tinge and became a dead white; the shell was smooth of texture and had very little gloss. They measured: .78 × .61; .75 × .61; and .73 × .62.

Cardinalis cardinalis cardinalis. CARDINAL.[1] — Common resident, but though I have found numerous nests in the thickets and moss-covered trees along the bayous after the nesting season is over, my occupied nests have been few.

May 29, 1910, I found my first nest. It was placed in a blackberry thicket on a farm about four miles west of the city, and contained two eggs. April 29, 1911, nest No. 2 was found in the open woods on Buffalo Bayou about eight miles west of the city. It was placed on the horizontal limb of an oak sapling, twelve feet from the ground, and was composed of twigs, corn husks and gray Spanish moss; inside, it measured one and three-quarter inches deep and three inches in diameter. It contained four slightly incubated eggs.

Nest No. 3 was discovered in a patch of cut-over woods on the north side of the bayou about nine miles west of the city; it was placed in a post-oak sapling five feet from the ground, and was composed of moss, plant fibre, corn husks, and pieces of newspaper. The lining was of smaller strips of corn husks and plant fibre. The three eggs which the nest contained were advanced in incubation. Date, May 6, 1911.

Nest No. 4 was six feet from the ground in a small oak sapling in a clearing of the Buffalo Bayou woods about six miles west of Houston, and on April 20, 1912, contained three eggs. It was composed of Spanish moss, pieces of broom weed, and dead leaves, and was lined with dry grasses. Nest No. 5 turned up on May 11, 1912, and contained three eggs. It was in a pear orchard on the farm where nest No. 1 was found, and was placed six feet from the ground on the tip of a limb. It was composed of Spanish moss, and lined with firmly-woven strips of corn husks about a quarter of an inch wide.

Nest No. 6 was an unusually small, neat structure, and when found on July 21, 1912, contained four newly hatched young. It was in a small oak on the edge of the orchard where No. 5 was found, and I feel sure belonged to the same pair of birds. The nest was composed of the usual corn husks and grasses, but contained no moss; it was firmly woven, and placed in a fork twelve feet from the ground; inside, it measured two and a half inches across by one and three-quarter inches deep.

Probably the most interesting nest of the lot was No. 7. I did not discover it until August 17 (1912), evidently some time after it had been

[1] These birds belong in all probability to the form which Bangs has described as *C. c. magnirostris* from Louisiana, cf. Proc. N. E. Zool. Club, IV, p. 5. March, 1903.

deserted. It was placed four feet up in a small peach tree in the orchard where the last two nests were found, and appeared to be an unusually high nest. It contained fragments of two Cardinal eggs and one egg of the Dwarf Cowbird. The nest was collected for the reason that the outer layer was composed of at least a half dozen cast-off snake skins, and on pulling it apart to determine the exact amount of that material used I was extremely surprised to find that it was a two-story structure. The lower floor contained two Dwarf Cowbird eggs imbedded in the nesting material.

The last nest, No. 8, was found on April 21, 1914, in a small thicket on Taylor's ranch, one mile south of Pierce Junction. It was placed two and a half feet up in a small Mexican mulberry, and contained three eggs, which were destroyed several days later by heavy rains.

One of the deserted nests which I found was placed thirty feet from the ground in the open woods on Buffalo Bayou, in easy view.

The eggs cannot with certainty be distinguished from those of the other subspecies of Cardinals, though some of the eggs are quite different. Set No. 1 measured: .90 × .72 and .88 × 71. Set No. 2 measured: .86 × .63; .82 × .65; .82 × .65; and .77 × .61. Sets 3, 4 and 5 in their respective order, yielded the following: 1.13 × .72; 1.04 × .71; .98 × .73; .93 × .71; .90 × .70; .89 × .71; 1.01 × .78; .99 × .75; and .98 × .76.

Guiraca cærulea cærulea. BLUE GROSBEAK.— This bird is a very rare summer resident in the vicinity of Houston, and I have found but one nest. On May 17, 1913, it was found in a small marshy place of an orchard on an old farm about four and a half miles west of the city. The male and female were both present, but were not at all noisy and showed no alarm. The nest was three and a half feet up in a small bush in a damp thicket, and was composed of grasses, corn husks and a few withered leaves. It was lined with fine brown rootlets and a few horse hairs; on the outside it was four and three-quarter inches in diameter; inside, two and a half inches in diameter by two inches deep.

The four eggs which the nest contained measured: .87 × .63; .86 ×.63; .85 × .62; and .82 × .62.

Passerina ciris. PAINTED BUNTING.— Rare summer resident; only one nest was found, and that on May 17, 1913, in a small bush in the thicket where I found the nest of the Blue Grosbeak, and not over fifty feet from that nest. The female flushed, and revealed four of its eggs and one egg of the Dwarf Cowbird. It was three and a half feet up in a small crotch, well hidden, and composed of weeds, grasses, strips of bark, leaves, and a few small twigs of grape-vine; the lining was of fine dry grasses. It was indeed a neat and compact little nest.

The four Bunting eggs measured: .80 × .58; .79 × .56; .78 × .58; and .77 × .56; and the egg of the Dwarf Cowbird: .75 × .59.

Spiza americana. DICKCISSEL.— Common summer resident on the prairies, and though I have several times found fragments of their egg shells I have found but one nest. On May 21, 1911, in the small marsh a half mile north of Pierce Junction, it was discovered, almost on the ground

in a small bush and well hidden. It was a compact structure, composed of grasses, weed stems, fragments of the dry marsh grass, and a few dead leaves, and was lined with finer dry grasses.

The four eggs which it contained measured: .88 × .64; .84 × .66; .83 × .65; and .80 × .61. The first specimen is quite pointed at the smaller end, while the last three are quite equally rounded at either end.

Piranga rubra rubra. SUMMER TANAGER.— Though a fairly common summer resident in the vicinity of Houston, particularly in deciduous woods, I have been able to locate but one of its nests. On July 6, 1912, I discovered the domicile of this bird, about twenty feet from the ground in an oak tree in a patch of oak woods on Buffalo Bayou about five and a half miles west of Houston. It was built in the smaller branches of the tree, near the extremity of the limb, and it was only by climbing above it that I was able to examine the contents, three young nearly ready to leave the nest. The nest itself appeared to be a very carelessly built structure, composed of a few grass stems, bark strips, pieces of dry leaves and weeds, and was lined with fine grass stems and a few catkins. Both parents were present, and very nervous; the female remained quiet while the male continually uttered its call of *pit-tuck, tuck.*

Geothlypis trichas trichas. MARYLAND YELLOW-THROAT.— Only one nest of this fairly common summer resident was found. On June 1, 1911, in a two-acre marsh a half mile north of Pierce Junction, I came on one of these birds which acted as if it had a nest nearby, so I lay down to watch. The bird, a male, was quite nervous, and it was some time before he would approach the nest; finally, after I had lost him for a moment, he appeared with an insect in his bill and flew to a tall clump of rushes about a hundred feet away. I was soon at the place, parting the stems, and it was but a moment until I located the nest. As I parted the rushes surrounding the nest, the three fully fledged young which it contained hopped from it and scattered in the surrounding grassy jungles, where I had some difficulty in catching them. The nest itself was wedged in between the stalks of the rushes about three inches above the slush of the marsh, and was composed of very coarse dry grasses and lined with the finer dry grass tops. Inside it measured one and forty-five hundredths inches in diameter and an inch and a half deep.

Icteria virens virens. YELLOW-BREASTED CHAT.— Very rare, and I have found but one nest. On May 8, 1910, a nest containing four eggs was found in low underbrush by the orchard of the farm where the nests of the Blue Grosbeak and Painted Bunting were found, and not over thirty feet from either of those nests. It was three feet up in a small thicket in a damp spot, and was composed of dry grasses, strips of bark, a few weeds and leaves, laid in layers. It was lined with finer grasses and a few rootlets; inside, it measured two and a half inches across by two and a quarter inches deep.

The four eggs measured: .92 × .69; .92 × .68; .91 × .70; and .87 × .67.

Bæolophus bicolor. TUFTED TITMOUSE.— On May 20, 1911, I located my first nest of this common resident. It was in an old Woodpecker hole thirty feet up in a tottering pine stump in a clearing in the Buffalo Bayou woods about nine miles west of the city. I could not examine it, for it was impossible to make my climbers hold in the soft wood, but I felt sure it contained young as one of the parents carried an insect in its bill.

On March 22, 1913, while wandering through the woodlands along the bayou about four and a half miles west of Houston, I found a cavity containing five eggs. The dead oak stood in open woods not a hundred yards from the line dividing the prairie and the timber lands. The nest was in a natural cavity, between the bark and wood of the stub of a five inch limb, about ten feet from the ground. It was a mass of rubbish of all sorts: pieces of dead elm leaves, horse hair, cast-off snake skin, small chips of the oak bark, cow hair, pieces of dead grass, small green lichens, weeds and plant fibres, and was back in the body of the tree eleven inches from the entrance. So closely did the bird sit that I was forced to pull her out by the tail. She was sitting with her head towards the heart of the tree, in a space scarcely large enough for her body.

The five eggs measured: .73 × .56; .72 × .56; .72 × .55; .71 × .56; and .70 × .56.

Hylocichla mustelina. WOOD THRUSH.— Very rare during the summer months in deciduous woods, and breeds.

On April 29, 1911, I discovered a nest in easy view on a bare limb of a small oak sapling in open oak woodlands on Buffalo Bayou about six miles west of the city. It was twelve feet from the ground and set firmly on a horizontal fork three feet from the trunk, and was composed of grasses, weed stems, inner fibre of Spanish moss, and fine rootlets; it contained large quantities of mud, and was shaped into a very neat bowl, the bottom almost flat and the sides perpendicular. No mud showed outside, though the sides of the nest were very thin, but the inside was as smooth as a piece of pottery, none of the nesting material showing through the wall of mud. Into this neat bowl had been placed a lining of fine rootlets and grass stems. The nest measured two and three-quarter inches in depth externally, two inches deep inside, four and three-quarter inches in diameter externally, and three and a quarter inches in diameter inside.

The nest contained one of the Wood Thrush's blue eggs and one egg of the Dwarf Cowbird. On May 6, I returned and found both eggs in fragments on the ground beneath the nest. On both trips the birds were present; the nest was deserted with the destruction of the eggs.

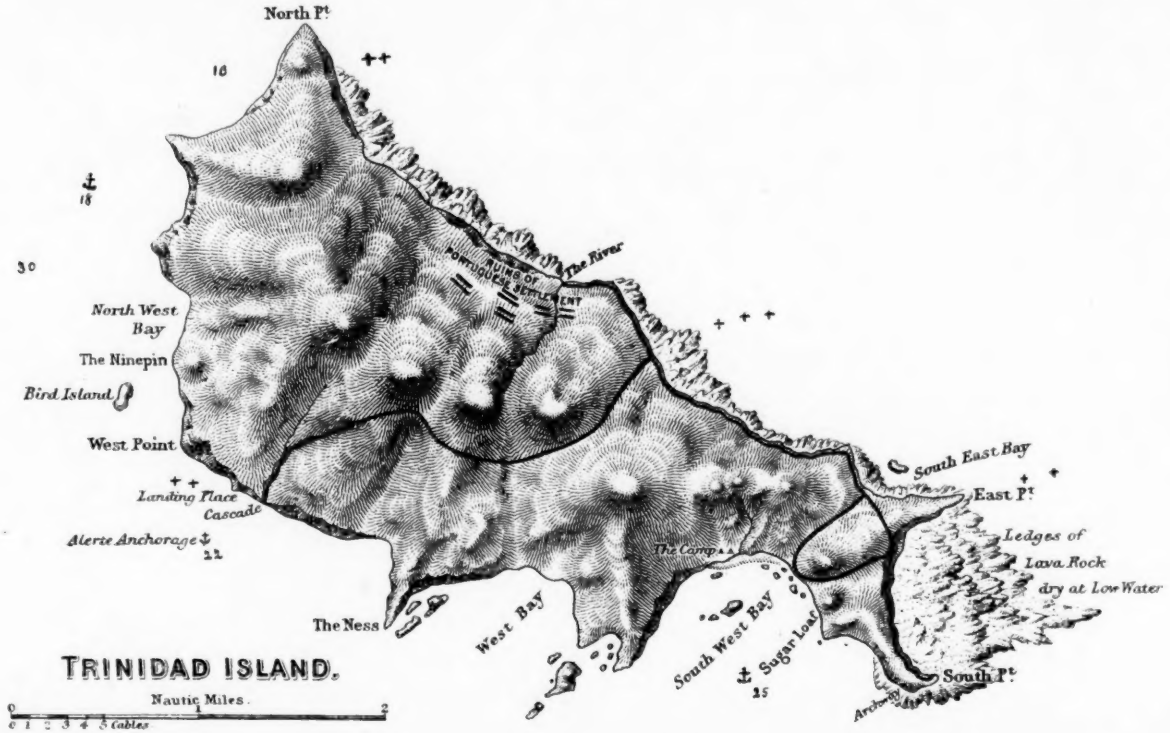
THE BIRD LIFE OF TRINIDAD ISLET.

BY ROBERT CUSHMAN MURPHY.

Plates XXIII–XXV.

EAST of the coast of Espirito Santo some seven hundred miles lies a fairy island. Alone in the tropical ocean, piled up in peaks as fantastic as tossing waves, and overhung with pennons of torn clouds which seem to flutter from the summits, Trinidad has exercised a strange charm upon the imaginations of all who have but seen its silhouette on the borderline of sky and sea. During four centuries it has been a landmark in the trade routes of the South Atlantic, often sought by sailing vessels as a check upon their nautical reckonings. Before the days of steamers it was a veritable signpost at a crossroads of the sea, yet few indeed are the travelers who have set foot upon its crumbling shore. Pirates in the old times, whalers, treasure-seeking adventurers, ill-fated colonists, in their turn have come to Trinidad and gone; the island seems unfalteringly to forbid the encroachment of permanent habitation. None who have felt its presence can speak or think of it unstirred; even the prosaic pages of the 'South Atlantic Pilot' become alluring at the account of Trinidad, and the Director of the British Antarctic Expedition of 1901, though he surveyed the islet with the critical eye of science, was deeply impressed by "the dream-like appearance of this remarkable cluster of volcanic peaks in the early tropical dawn."

Trinidad was discovered early in the sixteenth century by the Portuguese admiral, Tristan da Cunha; consequently it appears on most old maps of the western hemisphere. Captain Edmund Halley, afterwards Astronomer Royal to George the First of England, and of popular fame through his comet, visited the island in April, 1700, while conducting a voyage for the study of magnetic variation. Halley landed on April 15 in search of water, which he soon found. On the seventeenth he moored his vessel, the *Paramore Pink*, off the western end, with "the high steep Rock like a Ninepin E. S. E. Whilst the Longboat brought more water on


North Pt
16
18
30
The River
RUINS OF PORTUGUESE SETTLEMENT
North West Bay
The Ninepin
Bird Island
West Point
Landing Place
Cascade
Alerte Anchorage
22
South East Bay
East Pt
Ledges of Lava Rock dry at Low Water
The Camp
The Ness
West Bay
South West Bay
Sugar Loaf
25
South Pt
TRINIDAD ISLAND.
Nautic Miles.
0 1 2
0 1 2 3 4 5 Cables

board," he writes, "I went ashore and put some Goats and Hogs on the Island for Breed, as also a pair of Guiney Hens I carried from St. Helena. And I took possession of the Island in his Majesty's name, as knowing it to be granted by the King's Letters Patents, leaving the Union Flag flying.

"The Water of the Island being very fine and good I empty'd my Cisterns of their brackish St. Helena Water," continues the astronomer's account. "The Watering place we used was a little to the southward of the high Steep Rock, where the water run all the time we were there with a plentiful stream, but the Shoar being very rocky much endammaged our Cask."

Halley's goats and hogs were destined to have an overwhelming effect upon Trinidad, a subject to which I shall return below. The astronomer's claim to the island did not prevent a subsequent Portuguese attempt at colonization. In 1781 the English likewise tried to found a settlement, an enterprise terminated within three months, presumably by shortage of water. The ownership remained in doubt until 1895, when a dispute between Great Britain and Brazil regarding the possession of Trinidad as a possible coaling station, was decided by an international court in favor of Brazil, on the merits of original discovery by the Portuguese.

Narratives of brief calls at Trinidad may be found among many worm-eaten volumes of old voyages. For information regarding pirates and buried gold Mr. Knight's 'Cruise of the *Alerte*' should be consulted. The indomitable British sea-fighter and novelist, Captain Marryat, once crossed the island's mysterious mountains, and afterwards incorporated his experiences in his first novel, 'Frank Mildmay.' Whalers, which differ from merchantmen in that they are never in a hurry, still stop at Trinidad and lie offshore while their crews lower boats and spend the day fishing in the prolific coast waters. Among other visitors have been naturalists of passing scientific expeditions, whenever they may have found the sea sufficiently quiet to permit landing.

Trinidad lies in latitude 20° 30′ S., longitude 29° 22′ W., at the edge of the southeast trade-winds. Its width is hardly more than a mile and a quarter, a distance great enough, however, to require at least one day's laborious and perilous journeying over the single practicable mountain route. According to Prior, *l. c.*, rock

samples from Trinidad, "as well as many of the geological features of the island, such as the remarkable peaks of phonolite associated with basaltic lavas, suggest analogies between Trinidad and the Island of Fernando Noronha, off the coast of Brazil, a thousand miles to the north, so that it appears possible that the two islands owe their origin to a very similar, if not contemporaneous, volcanic outbreak." Over all the island the brittle, standing rock has assumed grotesque forms through extreme weathering. In the words of Mr. Knight, Trinidad "is rotten throughout, its substance has been disintegrated by volcanic fires and by the action of water, so that it is everywhere tumbling to pieces." Tremendous physiographic changes are brought about by the collapsing of outworn mountain sides. One of these changes is vividly described by Knight in the 'Cruise of the *Alerte*.' The author, with a companion, was vainly searching for a ravine through which he had descended to the northeastern coast of Trinidad nine years before. Eventually he found the way, which, however, was no longer a ravine. "The mountain on which we stood," he writes, "had fallen away, leaving a precipitous step some fifty or sixty feet in height, and from this step there sloped down to a depth, I should say, of quite 1,500 feet a great landslip of broken rocks, the *débris* of the fallen mountain. This landslip appeared to have taken place not long since. It was composed of rocks of all sizes and shapes, almost coal black, piled one on the other at so steep an angle that it was extraordinary how the mass held together and did not topple over. It was indeed in places more like an artificial wall of rough stones on a gigantic scale than a landslip."

Rainfall is rather plentiful at Trinidad, but the porous soil sucks up much of the water of the springs before it can flow to the sea, and recurring drought is one of the chief objections to human colonization. Another serious handicap is the island's boisterous shore, for the waves render landing almost continuously impossible during the winter months of June, July, and August, as well as during a large proportion of the remainder of the year. Southwest winds raise the heaviest seas, but the effects of far away *pamperos* are frequently manifested by huge breakers even when the weather is locally serene. During northerly winds there is a good lee, and relatively quiet water, along the southwestern coast. The wind-

ward beach of Trinidad is perpetually strewn with wreckage, for many a fine square-rigger, since the days of treasure-ships and slave-traders, has been lost among the outlying reefs. During favorable weather vessels may obtain drinking water at two places, on opposite sides of the island — the Cascade, and the river by the old Portuguese settlement. Explicit directions for watering are given by Captain Amasa Delano.

Probably the first naturalist to set foot upon Trinidad was the veteran botanist, Sir Joseph Hooker, in 1839, during the voyage of the *Erebus* and *Terror*. The vegetation, like most insular floras, comprises rather few species. Moreover, according to Hemsley, the flora is of recent origin as compared with that of St. Helena. Less than twenty species of vascular plants are known, of which several are ferns. The tree-fern, so conspicuous on the plateaus and higher slopes, is an endemic species, *Cyathea Copelandi*. The lower limit of its zone of growth was determined by the naturalists of the *Discovery* to be at an altitude of about eleven hundred feet. There are a few sparse grasses and sedges, a widespread, tropical, tangling bean (*Canavalia*), a sage, and several mosses and lichens including a tree-infesting *Usnea*. But the most striking element in the vegetation of Trinidad is its great groves of dead trees of the genus *Cæsalpinia*. Records of the old mariners say that the island was once heavily forested, even to the pinnacles of the Sugarloaf Mountain and the Ninepin. All its trees, however, have long since been dead, the last mention of living forests harking back to the eighteenth century. Captain Marryat, whose picturesque and truthful account of Trinidad appeared in his first work of fiction in 1829, relates the following observations regarding a valley among the island's hills:

"Here a wonderful and most melancholy phenomenon arrested our attention. Thousands and thousands of trees covered the valley, each of them about thirty feet high; but every tree was dead, and extended its leafless boughs to another — a forest of desolation, as if nature had at some particular moment ceased to vegetate! There was no underwood or grass. On the lowest of the dead boughs, the gannets, and other sea-birds, had built their nests in numbers uncountable. Their tameness, as Cowper says, 'was shocking to me.' So unaccustomed did they seem to man

that the mothers, brooding over their young, only opened their beaks in a menacing attitude at us, as we passed by them.

"How to account satisfactorily for the simultaneous destruction of this vast forest of trees was very difficult: there was no want of rich earth for nourishment of the roots. The most probable cause appeared to me, a sudden and continued eruption of sulphuric effluvia from the volcano; or else, by some unusually heavy gale of wind or hurricane, the trees had been drenched with salt water to their roots."

The wood of these gnarled trees is hard and imperishable, so that a similar condition obtains today, excepting that most of the trunks have fallen to earth. Knight's account is not unlike that of Captain Marryat; his conclusion also is the same:

"The mountain slopes were thickly covered with dead wood — wood, too, that had evidently long since been dead; some of these leafless trunks were prostrate, some still stood up as they had grown.... When we afterwards discovered that over the whole of this extensive island, from the beach up to the summit of the highest mountain — at the bottom and on the slopes of every now barren ravine, on whose loose-rolling stones no vegetation could possibly take root — these dead trees were strewed as closely as it is possible for trees to grow; and when we further perceived that they all seemed to have died at one and the same time, as if plague-struck, and that no single live specimen, young or old, was to be found anywhere — our amazement was increased.

"....Looking at the rotten, broken-up condition of the rock, and the nature of the soil, where there is a soil — a loose powder, not consolidated like earth, but having the appearance of fallen volcanic ash — I could not help imagining that some great eruption had brought about all this desolation;....I think this theory a more probable one than that of a long drought, a not very likely contingency in this rather rainy region."

Admitting a general impoverishment of vegetation, Copeland has suggested a still more probable agency than recent volcanic action. He asks whether the goats, introduced by Halley in 1700, may not have destroyed the trees of Trinidad, as happened, according to Darwin, to the trees of St. Helena. It has been pointed out that such a theory would involve both a change of climate and

the extermination of the goats themselves, a theory in harmony with the facts, for water is undoubtedly scarcer at Trinidad than a hundred years ago, while the last record of the goats is that of Sir James Clark Ross, who saw one in 1839. A third of a century earlier, in 1803, Captain Delano saw "plenty of goats and hogs," and "some cats" (the only record).

Other mammals of the island are mice, possibly introduced. Excepting birds, the remaining vertebrates are sea turtles, which lay their eggs in the warm sand of the beaches, and sea snakes,[1] reported by Knight as inhabiting the tidal pools. Crabs (*Gecarcinus lagostomus*) are by far the most abundant terrestrial animals, swarming over the whole island, their burrows everywhere undermining the soil. These saffron-colored crustaceans made a profound impression upon the imagination of Mr. Knight, who soon found that he could not lie down to sleep without being attacked by hordes of the creatures, which, he writes, "might well be the restless spirits of the pirates themselves, for they are indeed more ugly and evil, and generally more diabolical-looking than the bloodiest pirate who ever lived." At night the only resource, he states, was to rise and slaughter a large number of the crabs, when the others would devour "their dead brethren, making a merry crackling noise all round as they pulled the joints asunder and opened the shells." The common tropical rock crab, *Grapsus maculatus*, is found along the coastline of the island. Other living creatures collected or mentioned by various visitors are earthworms, flies, roaches, ants, earwigs, moths, dragon-flies, and five species of spiders.

About sunset of April 7, 1913, I sighted Trinidad, forty miles to the northward, from the masthead of the whaler *Daisy*. Early next morning the gray pile lay right in our path, with the rocks of Martin Vas barely visible in the east. The order for lowering the boats was given; we left the *Daisy* in the offing, and pulled ahead, fired with enthusiasm, toward the white-lined coast. Three Man-o'-war Birds were winding in and out between the topgallant

[1] Perhaps, however, Knight's "sea snakes" are morays. Copeland, *l. c.*, p. 276, records the capture, "in den Wassertümpeln des Riffs," of "einen seltsam gefleckten Aal, weiss und schwarz." The description fits the Atlantic spotted moray (*Gymnothorax*).

masts of the brig. An inquisitive Booby flew between two of the oarsmen in our whaleboat, and the Noddies (*Anous*) were scarcely less familiar. The White Terns (*Gygis*), and the several kinds of native petrels, were also very numerous, but they kept their distance, through indifference rather than fear. During the row toward shore the thunder of surf rang louder and louder in our ears, the sound rebounding from many rocky walls. The air was perfectly calm, but a southeasterly ground swell heaped up a tremendous surge of waters on the ironbound coast, which was formed either of the precipitous cliffs themselves, or of beaches about a yard wide completely strewn with sharp blocks of the mountain. The line of breaking water was, nevertheless, so narrow that at some places we could safely come within twenty feet of shore.

We approached the island at the Ness (*cf.* map), a peninsula of somewhat columnar rock which suggests a bit of the Giants' Causeway. From here we skirted the western end, ultimately rounding North Point, but nowhere finding a landing place. Whenever the whaleboat's prow was pushed close to the rock in a sheltered angle, the whole craft rose and fell in such a dizzy and appalling manner that several of our seasoned whalemen became seasick.

From the brig and the whaleboat I was able to enjoy a good view of the island's skyline and general topography through its length of four or five miles. At the southeastern end is a ridge-roofed promontory of brick-red volcanic tufa, terminating in the cliff of South Point, which is pierced by an archway. Knight has aptly styled this headland "Noah's Ark." According to the 'South Atlantic Pilot,' the surf sometimes breaks two hundred feet above its base. Overtowering Noah's Ark is the Sugarloaf (1160 ft.), which greatly resembles the conical mount of the same name at Rio Janeiro. The rock is gray phonolite, so worn and grottoed by pluvial action that its texture is like the cut surface of a Swiss cheese. Under this mount, says tradition, "there was an immense treasure buried, consisting principally of gold and silver plate and ornaments, the plunder of Peruvian churches which certain pirates had concealed there in the year 1821." Northwest of the Sugarloaf lies a green valley, with several clumps of shrubs. The mate of the *Daisy* told me that there is a cluster of stone-

marked graves on the northern side of the valley. The highest point of Trinidad, 2020 feet on the Admiralty chart but 3000 according to the 'South Atlantic Pilot,' is near the center of the island. The summits of the ridges are more than serrate, being a succession of needle like pinnacles. At the western end of the island stands one of the most remarkable rock structures in the world, the Ninepin of Halley, known also as the Monument, and the Priest, a cylindrical tower of dark gray stone, doubtless a phonolitic dike, rising from the ocean to a height of nearly nine hundred feet. In common with all the bare steeps of this isle, the surface of the Ninepin is pitted and undercut into designs like arabesques. In outline and proportion the great column may be compared with the two distal phalanges of a man's index finger. Leaning slightly less than the Tower of Pisa, planned on the grandest scale of Nature's architecture, its utterly inaccessible wall furnishes nesting chambers for tens of thousands of feathered sprites, which sit within their niches like saints about a cathedral spire. No sight had ever seemed so impressive as I gazed from the small boat straight upward to the Ninepin's lofty summit, enveloped in a cloud of midge like birds.

Since landing was out of the question, we began fishing with considerable success off the West Point, just outside the line of breaking sea. The bottom was very rocky, varying in depth from three to seven fathoms. Many of the captured bottom fishes were brilliantly colored. The largest species, excepting sharks, was a red-spotted garupa (*Epinephalus?*), in several instances over four feet long and weighing fifty or sixty pounds. Several kinds of trigger-fish (Balistidæ) proved abundant. Here, as at Fernando Noronha, we lost many of our prizes because of sharks, the lines often coming inboard with nothing but fishes' heads on the hooks. Even one of our largest garupas was nipped in half. We succeeded in hooking and harpooning a number of cat sharks (*Ginglymostoma*), the ugly mouths of which harbored curious, extensible leeches. Larger sharks were about the brig all day, and a Booby which was shot and wounded so that it fell into the water, first had its legs bitten off, and was then devoured as one morsel. At the surface of the sea near shore were schools of needle-gars (*Hemirhamphus*). The mandible of this small fish is long, resembling the beak of a

swordfish, but the upper jaw is very short. They have an especially curious appearance when they open their mouths widely to feed, the seemingly useless bill merely passing beneath a bit of food. Our sailors threw scraps of fat into the water alongside the whaleboat, and captured many of the needle-gars with their hands. Altogether we caught approximately two hundred fishes, representing nine species, of which two have proved new to science. Seventeen species are known from Trinidad, but the whole number of native fishes is doubtless far greater, and the abundance of individuals almost beyond exaggeration.

While we were fishing, a number of flat, triangular flies, *Pseudolfersia spinifera*, a species which lives as a parasite among the feathers of the Man-o'-war Bird, flew into the boat. They scuttled sidewise like crabs, adroitly dodging capture, and seemed bent on getting on the *under* side of whatever they alighted upon, whether a gunstock, one's hand, or a thwart of the boat. These flies were the only insects we saw.

Birds were about in countless hosts, filling the air and covering the rocks. The Noddies (*Anous stolidus*) were incredibly confident and curious, hovering round our heads, even alighting upon them, and peering into our faces so closely that one had to look at them cross-eyed. It was the simplest matter to catch them in the hand as they fluttered among us. Four of them I banded with aluminum rings of the American Bird Banding Association — numbers 7941, 7943, 7945, 7947; may their wearers once again entrust themselves within the clutches of a naturalist! But the Noddies were not one whit more abundant than the exquisite Love Birds (*Gygis*). At Trinidad there are perhaps more of these terns than anywhere else in the world. They were flying mostly in pairs, and pairs also were sitting together in many rocky niches. Most delicate and wraith like of birds are these White Terns; when they fly against the glare transmitted from a bright sky, the dark line of their wing bones is projected like an x-ray shadow through the milk-white feathers.

Boobies soared among the pinnacles a thousand feet above us. Man-o'-war Birds, flying overhead, seemed all head, wings, and tail. There are two species at Trinidad, and both were more interested in the brig offshore than in our tiny whaleboats. The

Man-o'war Birds are notorious pirates in their feeding habits, but I saw a troop of the smaller species (*Fregata ariel*) fishing for themselves. Half a dozen of them hovered in a row over a school of small surface fish, and faced in a direction opposite to that in which the fish were moving. While the birds poised close over the water they beat their big wings slowly. Then at the right moment they struck downward, swinging their long bills like scimitars back under their bodies, the hooked tip seizing a fish from the rear. They seemed to catch three or four a minute, and yet made no commotion among the moving school of their victims. One Man-o'-war Bird was caught on a fishhook from the *Daisy*.

Trinidad's endemic petrels, of the genus *Æstrelata*, were as numberless as the Noddies. Arminjon's Petrel, which was nidificating or perhaps only resting, in water-worn cells of the rock, made up the bulk of these birds. They frequently quarreled with one another in air, chattering not unlike terns. They were perfectly fearless, but disinterested. Specimens shot had not long since bred, for the abdomens were bare. The black species, *Æ. trinitatis*, seemed somewhat less common. During the forenoon I had shot one of the latter with the right barrel of my gun, in the vicinity of two small rocks near the Ninepin, when a very white petrel flew swiftly toward us from the sea. Intuitively, in that momentary glimpse, I recognized a bird with which I was not familiar. A fortunate, long shot, straight up from the shoulder, brought it hurtling to the water, and we reached it sooner than the sharks. It proved to be a species new to science, more beautiful than all its congeners, clad in a black-flecked cloak like ermine. I have named it *Æstrelata chionophara*, the Snowy-mantled Petrel.

All the birds that we saw were, of course, sea birds — none others have been found at Trinidad. But through the whole day, while our little boat skirted the seething edge of ocean, I gazed longingly at the tree-ferns far above, and could not help thinking that there may have been unknown land birds there, among the spires of the fascinating, unattainable mountains.

Annotated List of Birds.

1. **Numida (meleagris?)** Linné. Nothing further has ever been heard of Halley's " Guiney Hens " beyond the fact that he freed a pair on Trinidad in April, 1700. The same lack of history applies to a domestic cock and two hens brought from England by Sir James Clark Ross in 1839, and placed ashore " with a view to add somewhat to the stock of useful creatures."

2. **Puffinus gravis** (O'Reilly).? A large white-breasted shearwater, believed to have been of this species, was seen by Nicoll (Three Voyages, p. 61) within half a mile of shore at the islets of Martin Vas, twenty-six miles east of Trinidad, on January 5, 1906.

Puffinus gravis occurs as a rover all over the tropical and south temperate Atlantic. It has been collected by the writer, during the month of March, due south of Trinidad in latitude 39° S. It has been suggested that the species may breed on the island of Tristan da Cunha or one of its outliers.

3–5. **Æstrelata arminjoniana** Gigl. & Salvad. *Æstrelata arminjoniana*, Gigl. & Salvad., Ibis, 1869, p. 62. Giglioli, Distr. Fauna Vertebr. Oceano, 1870, p. 42. *Œstrelata mollis*, Saunders, Proc. Zool. Soc., 1880, p. 164. *Œstrelata arminjoniana*, Salvin in Rowley's Ornith. Misc., Vol. I, 1876, pp. 234, 252, pl. 31. Salvin, Cat. B. XXV, p. 413. Lowe, Bull. B. O. C., XIX, p. 98. Wilson, Ibis, 1904, p. 213. Sharpe, Ibis, 1904, p. 215. Nicoll, Bull. B. O. C., XVI, p. 102; Ibis, 1904, p. 41. Godman, Monogr. of Petrels, 1908, p. 229, pl. 65. *Œstrelata armingoniana*, Nicoll, Ibis, 1906, p. 671. *Œstrelata wilsoni*, Sharpe, Ibis, 1904, p. 216. Nicoll, Ibis, 1906, p. 671; Bull. B. O. C., XVI, p. 103. *Œstrelata alba*, Brabourne & Chubb, Birds So. America, I, 1912, p. 31.

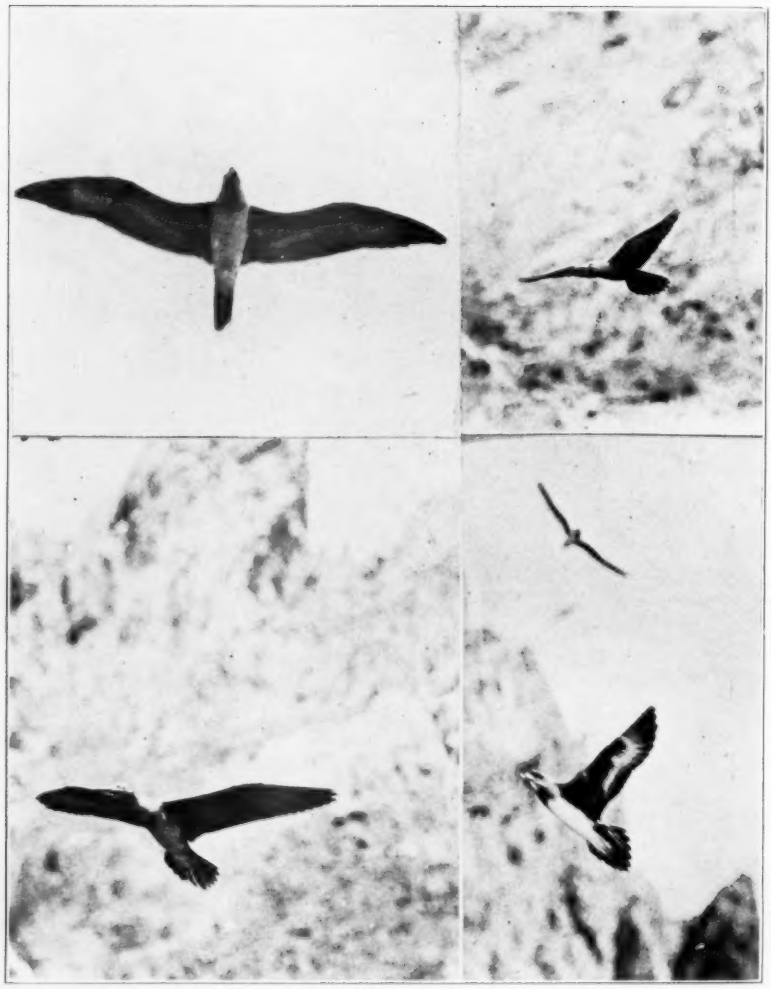
Æstrelata trinitatis Gigl. & Salvad. *Æstrelata trinitatis*, Gigl. & Salvad., Ibis, 1869, p. 65. *Pterodroma trinitatis*, Gigl. Distr. Fauna Vertebr. Oceano, 1870, p. 40. *Œstrelata trinitatis*, Salvin in Rowley's Ornith. Misc., I, 1876, p. 253, pl. 32; Cat. B. XXV, p. 413. Wilson, Ibis, 1904, p. 213. Sharpe, Ibis, 1904, p. 215. Nicoll, Bull. B. O. C., XVI, p. 103; Ibis, 1906, p. 671. Godman, Monogr. of Petrels, 1908, p. 232, pl. 66.

Æstrelata chionophara Murphy. *Æstrelata chionophara*, Murphy, Auk, XXXI, 1914, p. 12, pl. 2.

Nine specimens of petrels were collected at Trinidad, of which five are referable to the species *arminjoniana*, three to *trinitatis*, while the other has been made the type of a new species, *chionophara*. It is remarkable that no example of the gray-breasted phase of *arminjoniana*, the phase described by Dr. Sharpe as *Æstrelata wilsoni*, was either collected or observed during our day about the island.

These three species of closely related, endemic petrels, are the only Tubinares known from Trinidad, since the record of *Æstrelata mollis* (Saunders, P. Z. S., *l. c.*) was based upon an incorrect identification.

Brabourne and Chubb, *l. c.*, perhaps following a suggestion made in Rowley's Ornithological Miscellany, have synonymized *arminjoniana* with *Æstrelata alba* of Gmelin. In justification of this step the authors allege



ON LEFT; IMMATURE BOOBIES, PROBABLY *Sula piscator*.
ON RIGHT; UPPER, NODDY (*Anous stolidus*); LOWER, TRINIDAD PETREL (*Æstrelata arminjoniana*).

"Rio Plata" to be the type locality given by Gmelin, Syst. Nat. I, 1789, p. 565. In this citation an error has evidently been made, for Gmelin, nowhere mentioning Rio Plata, simply follows Latham, Synopsis, III, 1785, p. 400, where it is stated that the species "Inhabits *Turtle* and *Christmas Islands*." Pending further light on the subject, *Æ. alba* must therefore continue to stand as a doubtful synonym of *Æ. neglecta*.

We first saw *Æstrelata arminjoniana* on April 4, 1913, in latitude 25° S., longitude 30° 40′ W., nearly four degrees south of Trinidad. This species became increasingly common on the fifth, sixth, and seventh of the month, as we approached its headquarters. *Æ. trinitatis* was seen only on April 8, in the immediate vicinity of the island, and neither bird was noted again, although I kept a sharp lookout for several days after we had proceeded on our northward journey.

The validity of the species *trinitatis* has long been questioned, Salvin (Cat. B. Brit. Mus.) and others considering it merely a dark form of *arminjoniana*. It has lately been noticed by both Wilson and Nicoll that *trinitatis* breeds at a higher altitude on Trinidad than *arminjoniana*, and this fact, together with the apparently constant color differences of plumage and feet, is the present warrant for granting specific distinction to the two birds. The evolution of several well-differentiated representatives of one circumscribed section of a genus, whether they be true species or merely color phases, is an interesting and rather common phenomenon in the genus *Æstrelata* (*viz. jamaicensis* and *neglecta*), and indeed among Tubinares in general. As regards the relationships of the petrels inhabiting the small oceanic island of Trinidad, it is not improbable that the parti-colored forms (*arminjoniana*, "*wilsoni*," *chionophara*) are of relatively recent origin, and that this small group of birds is still specifically unstable. Such a hypothesis can at least be made to fit the facts, although a final decision must be reserved until a large series of specimens, representing every stage of growth, can be studied. Assuming the uniformly colored *trinitatis* to be nearest the parental stem, I find that I can formulate the following progressive arrangement, partly on the basis of my own specimens, partly on published information:

a. Downy young of all the species, so far as known, dark gray.

b. *trinitatis*, immature. Bill black; tarsi and feet black; plumage uniformly blackish-brown; concealed portions of the feathers light gray with dark shafts.

c. *trinitatis*, adult. The same, except that the concealed portions of the feathers are pure white, including the shafts.

d. *arminjoniana*, immature (dark "*wilsoni*" phase). Bill black; "tarsi and basal half of the toes very dark brown" (Nicoll), distal half of toes black; dorsal plumage like that of *trinitatis*; breast dark gray.

e. *arminjoniana*, older than the last but not fully mature — or possibly the mature bird in fresh plumage? (light "*wilsoni*" phase). Bill black; tarsi, and basal half of web and two inner toes, flesh color; distal half of foot black; breast more or less dark, sometimes showing only on the ex-

treme tips of the white feathers; a broad, mottled collar of gray crossing the throat and upper breast.

f. *arminjoniana*, fully mature. Similar to the last, but with a pure white throat, breast, and belly, the only dark on the under surface being on the collar, lower flanks, and crissum.

g. *chionophara*, adult. Bill flesh color, with a dark unguis; tarsi and feet flesh color; entire under surface, excepting lower flanks and tips of under tail-coverts, white; back white with dark feather shafts and rhomboid speckles.

In all my specimens of the three species, the dark plumage of the pileum, back, wings, and tail, is of exactly the same color, excepting that one example of *arminjoniana* is somewhat slaty on the back, owing to wear and disintegration of the feathers.

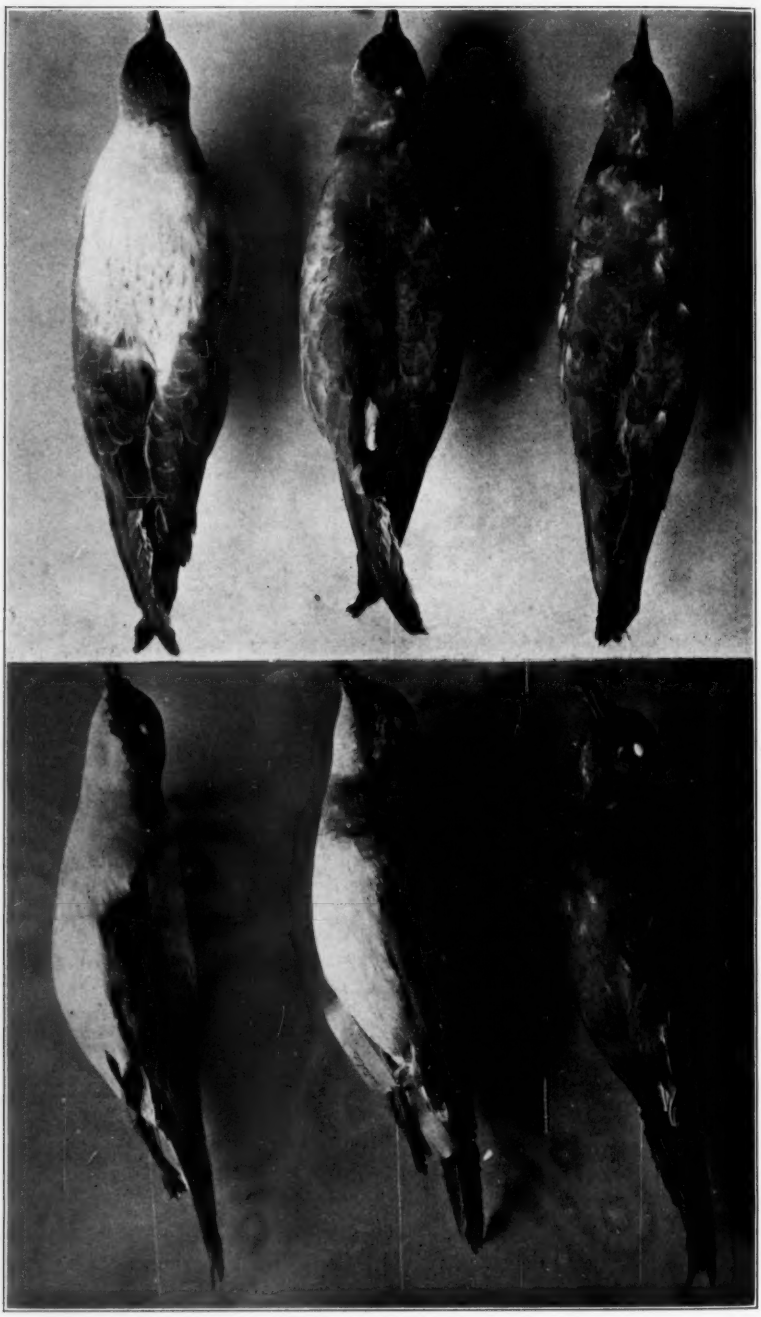
Among the five specimens of *arminjoniana* and the three of *trinitatis*, there is considerable individual variation in the depth of the bill; *chionophara* has a more slender bill than either of the others, although it is equally long. *Chionophara* has relatively the shortest tarsus and the longest foot.

Future study may yet demonstrate that *arminjoniana* and *trinitatis* are one species; possibly even *chionophara* may also be included, or may prove to be a freak. The last bird is of such striking distinction, however, that the only just course was to describe it and give it a name. Mr. Fuertes' drawing (Auk, XXXI, Pl. II) is a beautiful likeness. It also shows the bird in the correct resting position for an *Æstrelata*, and the background is quite suggestive of its habitat.

Measurements of the specimens are appended. The birds marked "breeding" had large brood-patches, and had evidently been incubating. The testes of the males, however, were non-active and partly pigmented, as might be expected in the month of April of Tubinares which breed in the southern hemisphere.

Measurements of Skins.

	Exposed culmen	Tarsus	Middle toe and claw	Wing	Tail
Æ. arminjoniana					
R. C. M. 1974 (in alcohol)					
1975 ♂ ad.	31	38	49.5	277	114
1977 ♂ breeding	30	37.5	48	290	113
1976 ♀ breeding	29	36	48	279	111
1978 ♀ breeding	29	37	47	268	109
Average of 4	30	37	48	279	112
Æ. trinitatis					
1979 ♀	30.5	35	48	276	111
1980 ♀	31	35.5	46	273	104
1981 ♀	28	34.5	45	272	108
Average of 3	30	35	46	274	108
Æ. chionophara					
1982 ♀ ad (type)	30	33	51	285	115



LEFT TO RIGHT: ÆSTRELATA CHIONOPHARA (1982), Æ. ARMINJONIANA (1975) AND Æ. TRINITATIS (1979).

6. **Sterna fuliginosa** Gmelin. The Sooty Tern doubtless occurs at Trinidad, for Nicoll, 'Ibis,' 1906, p. 673, records it as inhabiting the rocks of Martin Vas.

7. **Anous stolidus** (Linné). *Anous stolidus*, Nicoll, Ibis, 1906, p. 670. In spite of the enormous numbers of Noddies noted by our party at Trinidad, there seems to be no earlier specific record than that of Nicoll, who found these birds abundant, and breeding, on the occasion of his landing in January, 1906. None was collected during the visit of the *Venus* in August, 1874, and Dr. Wilson, Naturalist of the *Discovery*, reports that on September 13, 1901, the "small, black, Tern-like bird .... was by no means frequently seen and was not familiar or inquisitive; consequently no specimen was obtained." (Ibis, 1904, p. 210.)

From these data the conclusion may be drawn that this conspicuous species is common on the rocks and over the shore waters of Trinidad only during the season of southern summer. It is not unlikely that a migration to and from distant islands, or continental coasts, occurs during the months between May and December.

Unfortunately there is only one example of the Noddy among my Trinidad specimens, an immature bird with worn contour feathers but new quills. Its measurements agree with those of specimens from Dry Tortugas, Florida.

8. **Micranous leucocapillus** (Gould). One record from Martin Vas Rocks, January 5, 1906. (Nicoll, Ibis, 1906, p. 673).

9. **Gygis crawfordi** Nicoll. *Gygis candida*, Saunders, Proc. Zool. Soc., 1880, p. 163; Cat. B. XXV, p. 151. Wilson, Ibis, 1904, p. 210. *Gygis alba*, Sharpe, Ibis, 1904, p. 217. *Gygis crawfordi*, Nicoll, Bull. B. O. C., XVI, 1906, p. 102; Ibis, 1906, p. 669. Murphy, Auk, 1915, p. 48. "Little snow-white tern," McCormick, 'Voyages,' *l. c.*, p. 24.

This recently recognized species is the Atlantic representative of the genus, breeding on Fernando Noronha, Ascension, Trinidad, and St. Helena, but far more numerously on Trinidad than anywhere else. All the naturalists who have visited Trinidad have mentioned it. Sitting birds, eggs, and gray downy young in various stages of growth, have been observed in April, August, September, and January. Therefore this tern breeds practically throughout the year, "from sea-shore to the extreme summit of the island," laying a single beautifully marked egg on the rock, or on a stump or branch of a dead tree. According to Nicoll, the young exhibit great tenacity in clinging to their precarious perches.

10. **Sula piscator** (Linné). *Sula piscator*, Saunders, Proc. Zool. Soc., 1880, p. 163. Ogilvie-Grant, Cat. B. XXVI, p. 434. Nicoll, Ibis, 1906, p. 672. *Sula piscatrix*, Sharpe, Ibis, 1904, p. 214.

This Booby breeds apparently throughout the year. Excellent photographs of the bird and its nesting site have been published by both Murray and Nicoll (see references), while Knight gives an account of the nesting colonies in the ravines on the island's northeastern coast. Flying fish are known to make up part of the bird's food.

North of the Equator, on April 23, 1913, an immature Booby, probably of this same species, flew around the *Daisy* just after sunset and finally alighted on the prow of the stern whaleboat. It paid little attention to the helmsman, and was not disturbed even by the noise and riot of a rat-hunt on board. About dusk it worked its head down between the scapular feathers, its bill pointing straight down its spine, and slept soundly. The gentle motion of the ship did not disturb its balance; it swayed slightly, but rested firmly on both feet. At half past five next morning it was disturbed by a sailor entering the stern boat to get a bucket, and flew off.

Two other Boobies, *Sula cyanops* and *Sula leucogaster*, have been taken at Ascension, Fernando Noronha, or elsewhere in the tropical Atlantic, but neither species has yet been recorded from Trinidad.

11. **Fregata minor nicolli** Mathews. *Fregata aquila*, Saunders, Proc. Zool. Soc., 1880, p. 163. Ogilvie-Grant, Cat. B. XXVI, p. 447. Sharpe, Ibis, 1904, p. 215. Nicoll, Ibis, 1906, p. 673. *Fregata minor nicolli*, Mathews, Austral Avian Record, II, No. 6, 1914, p. 118. Rothschild, Novit. Zool. XXII, 1915, p. 145.

The recent study by Mathews, together with prompt corrections and elaborations by Rothschild, have split up the Man-o'war Birds into five species, of which *F. minor* is represented by five races ranging through the Indian and western Pacific Oceans, and northward in the Atlantic to Trinidad. *Fregata aquila* is now stated by Rothschild to be confined to the type locality of Ascension Island, while the Trinidad form, based on the study of a series (apparently about twelve specimens), has been described by Mathews as a subspecies of *F. minor*.

Man-o'-war Birds, of either this or the following species, are said to nest in large numbers on the crags near the North Point of Trinidad. They have been found incubating in August, but, according to Nicoll, were not breeding in January, 1906.

12. **Fregata ariel** (Gould) **subsp.?** *Fregata ariel*, Sharpe, Ibis, 1904, p. 214. Nicoll, Ibis, 1906, p. 673. 'Atlantic form' of *Fregata ariel*, Mathews, Austral Avian Record, II, No. 6, 1914, p. 121.

Two specimens of this small species have been brought to the British Museum from Trinidad — an immature example collected by the explorers of the *Discovery*, and an adult male obtained by Nicoll.

All which I saw were immature birds. I have none in my collection, but a specimen caught on a fish hook was skinned by the captain of the *Daisy*, and is now, I believe, in the Milwaukee Museum. I find in my notebook the following incomplete description of this specimen, together with a mention of its small size: — Head and neck white; a chestnut stripe running from the mentum down the front of the neck to the upper breast, forming a solid spot on the throat; back, wings, breast, flanks, tail, upper and under tail coverts iridescent greenish-black, the feathers of the scapular and interscapular regions edged and tipped with brown; a scale like row of brown feathers with darker shafts and whitish edges, extending along the wing from wrist to elbow; belly white; feet flesh color; bill horn color;

sex undetermined. The specimen was invested with a Mallophagan parasite (*Lipeurus gracilicornis minor*) taken also from Tropic-birds (*Phaëthon lepturus*) at Fernando Noronha.

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EARLY RECORDS OF THE WILD TURKEY. V.

BY ALBERT HAZEN WRIGHT.

(*Concluded from p. 224.*)

Michigan, Wisconsin, Indiana, and *Illinois.*

IN this area the wild turkey held its own against two centuries of civilization's advances. The first note comes in 1658–1660 when Peter Esprit Radisson (l. c. pp. 152, 212) finds in the country of the "Pontonatemicks" (Lake Superior region) "there are so many Tourkeys that the boys throw stones at them for their recreation." Of this same region, he again says "many have Turkeys." The Jesuit Relations speak of the turkey in this region in several accounts. In 1661 and 1662 they assert that in the Mississippi valley [1] "Turkeys and fowls fly in flocks as Starlings do in France." In 1669–70, Marquette, when in the Illinois country, finds [2] "There is fine hunting of....Turkeys,...." Along the Mississippi River, the Relations of 1672–74 say [3] "Turkeys strut about, on all sides," and of Illinois River they hold that "Turkeys are found there in greater numbers than elsewhere." On Marquette's Voyage,

[1] The Jesuit Relations.... Vol. XLVII, p. 143.
[2] ibid., Vol. LIV, p. 189.
[3] ibid., Vol. LVIII, pp. 99, 107.

1673–77, we find that they, on the upper Mississippi reached [1] "the parallel of 41 degrees 28 minutes," "Turkeys had taken the place of game." In the Illinois country, "There was more snow there then elsewhere as well as more tracks of animals and Turkeys" and they here find themselves "in a fine place for hunting cattle, deer and turkeys, which are excellent...." According to Allouez,[2] "they hunt....Turkey" in Illinois, and, for the same region, Binnetau in 1699 records, "Game is plentiful such as ducks.... Turkeys." In 1698, Hennepin mentions Turkey-Cocks for the head of the Illinois River. When along the Mississippi, he says [3] "I observed they have tame Poultry, as Hens, Turkey-Cocks, and Bustards, which are as tame as our Geese." "The country affords all sorts of Game as Turkey-Cocks....," and "in our way we kill'd seven or eight Bustards or Wild Turkeys, which in these Countries encrease mightily." In general, "There are to be had....Turkies, which are of an extraordinary bigness."

In 1703, La Hontan holds [4] "The River of the Illinese is intitled to Riches, by vertue of the benign Climate, and of the great quantities of....Turkeys that feed on its brinks." In 1712, Marest records that along the Illinois River,[5] "Turkeys are likewise found here in abundance and they are as good as those of France." In 1750, a letter from Vivier finds in the Illinois country that [6] "Wild turkeys abound everywhere, in all seasons, except near the inhabited portions." In the same year the mission at Detroit purchased turkeys from the natives at several different times.[7] Twenty-eight years later (1778) Hutchins records in Illinois that [8] "*Savannahs* or natural meadows, are both numerous and extensive; yielding excellent grass, and feeding great herds of Buffaloe,.... Turkies...." Lastly in 1791, J. Long, the Indian interpreter gives the Chippeway name for Turkey as [9] "Weenecobbo." The following year (1792) John Heckewelder made a journey to the

[1] ibid., LIX, pp. 111, 171, 173, 177.
[2] ibid., LX, p. 163: LXV, p. 73.
[3] Hennepin, L. l. c., pp. 93, 94, 123, 137, 149; continuation, p. 137.
[4] La Hontan, l. c., pp. 134, 112.
[5] The Jesuit Relations, Vol. LXVI, p. 225.
[6] ibid., Vol LXIX, pp. 143, 145, 257.
[7] ibid., LXX, pp. 59, 63, 43.
[8] Hutchins, l. c., p. 44.
[9] Early Western Travels, Vol. II, p. 263 (orig. p. 223).

Wabash.[1] "Wild turkeys and deer were seen in great numbers on the banks of the Ohio." Below Vincinnes on one October day they took five turkeys. Opposite Louisville at another time they shot four more and the same success was experienced at several other places.

At the beginning (1801) of the next century Matthew Carey says that in the Northwestern and Indiana Territories,[2] "Turkies.... are in greater plenty here, than the tame poultry are in any part of the old settlements in America." Not until 1816, do we discover the next pertinent note. David Thomas in the Wabash country at first writes that[3] "We had been taught to expect that turkies were very numerous, but we have been disappointed, for certainly we have not seen half a dozen full grown in all the Western Country." Later, he holds that "at that (above) time it appears that these fowls were hatching or secreted with their young." "*Wild Turkies* abound in this country." The next year 1817, Samuel R. Brown records that[4] "Wild turkies abound in the hilly districts" of Illinois. "The woods (of Indiana) abound with deer, bears, wolves and wild turkies." "In travelling seven miles through the woods of Dearborn county I counted two bears, three deer and upwards of one hundred turkies; more than half of the latter however are young ones, just beginning to fly." In Michigan he also notes this species.

In the early days of Illinois, Morris Birkbeck[5] tells us that when the stock of provisions failed, the wild turkey was one of the last resorts. Its pursuit also served the pioneer with plenty of strong exercise. The same author in his "Letters" writes[6] "We are now feasting on wild turkeys. We have not sat down to dinner for the last month, I believe, without a fine roast turkey. They weigh about twelve pounds, and are sold five for a dollar. Some weigh

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[1] Penn. Mag. Hist. and Biog., XII, pp. 166, 173, 176.

[2] Carey, Matthew. American Pocket Atlas. 2nd edit. Phila., 1801, p. 76.

[3] Thomas, David. Travels through the Western Country in the Summer of 1816.... Auburn, 1819, pp. 161, 162, 210.

[4] Brown, S. R. The Western Gazetteer; Auburn, N. Y., 1817, pp. 30, 48, 78, 169.

[5] Birkbeck, Morris. Notes on a Journey in America,.... 3rd edit., London, 1818, pp. 123, 149.

[6] Birkbeck, M. Letters from Illinois. Phila., 1818, p. 63.

twenty-five pounds — I have heard of thirty. They are fat and tender: better I fancy, than Norfolk turkeys; but I must not be too positive on this nice point." In 1817, Fordham when in Illinois and Indiana, narrates how "game is as plentiful as in other parts of the U. S. east of the Mississippi," [1] turkeys being among the forms he mentions. Two years later, 1819, Faeron finds [2] turkeys in tolerable quantities in Illinois, and in Michigan Dana reports [3] them in plenty. Hulme in a "Journal of a Tour in the Western Countries September 30, 1818–August 8, 1819" remarks that [4] "On our way to Princeton (Ind.), we see large flocks of fine wild turkeys,.... Some of the inhabitants who prefer sport to work, live by shooting these turkeys...." In the same year, Richard Flower says that at Albion, Illinois, one can secure,[5] "a fine turkey (for) a quarter of a dollar," and, in another series, he notes "turkeys in plenty, having purchased four for a dollar the preceding week." Along the Wabash River in 1819, John Woods tells how [6] "they killed....some turkeys: these they were obliged to eat without bread, but once they procured a few potatoes at a cabin." In Illinois, he says, "The birds are turkeys,...." "Turkeys are of a large size; we bought many during the winter for 25 cents each. At that time they were in general, thin, but in the spring, they get very fat; we bought one in April that weighed more than 20lb. for 1s 8½ d." In 1819, W. Faux reports turkeys from Vincennes and Princeton, Ind. At the latter place, he records [7] "turkeys in sickening abundance." Later, in his account, he says, "Colonel Boon and his party, being without bread for six months, used wild turkey to their meat as a substitute." In one instance, he gives the prejudiced view of an Englishman who retorts "You talk about your wild turkies and your game, but they are not there; game is more scarce than in England." At Bain-

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[1] Fordham, E. P. Personal Narrative,.... Edited by F. A. Ogg. Cleveland, O., 1906, pp. 119, 143.

[2] Fearon, H. B. Sketches of America.... 3rd edit., London, 1819, p. 257.

[3] Dana, E. Geographical Sketches on the Western Country:.... Cincinnati, 1819, p. 262.

[4] Early Western Travels, X, p. 49 (orig. p. 279).

[5] Ibid., X, p. 108 (orig. p. 30), 124 (orig. p. 13).

[6] ibid., X, pp. 263 (orig. p. 147), 291 (orig. p. 196).

[7] ibid., XI, pp. 143 (orig. p. 136), 210 (217), 228 (238), 256 (272), 263 (282).

bridge, O., on September 5, 1819, Adlard Welby, another Englishman sees the wild Turkey,[1] "which seemed to resemble exactly our dark tame breed." At the mouth of the Ohio, 1819, Nuttall finds[2] "The whole country here, on both sides of the Mississippi and the Ohio,.... abounds with various kinds of game, but particularly deer and bear, turkeys..." The Expedition of Major Stephen H. Long on May 27, 1819, records[3] the turkey at Shawneetown on the Ohio. Schoolcraft (l. c., 114) in 1821 on the Wabash River says, "The turkey....often appear, to enliven this part of the river (Mississineva River)." In another work he records that at Prairie di Chien[4] "the wild turkey,....are also common along this part of the Mississippi,...." On his excursion of 1822–23, W. H. Blane (l. c., p. 239) at Carmi, Ind., "passed on a single day's ride....five gangs of wild turkeys." In "Remarks made on a Tour to Prairie du Chien....in 1829" (p. 166) Caleb Atwater gives the Sioux name for Turkey, as "Zezeha, Zezecha tunka." In 1832 Timothy Flint (l. c., p. 384) writes, "Wild turkeys have been supposed by some, to abound as much on the waters of White River, as they do in the settled regions. Hundreds are sometimes driven from one cornfield." The same year, Vigne (l. c., p. 61) finds "Wild turkeys are there very plentiful," in Indiana and Illinois. In the winter of 1832–33, Maximilian Prince of Wied says,[5] "The most interesting of the birds in this part (New Harmony on Wabash) is the wild turkey, which was extremely numerous, and is still pretty common. A large cock was sold at Harmony for a quarter of a dollar. A young man in this neighborhood, who supplied the place with this delicate game, had often ten or fifteen hanging about his horse at the same time." Later, he writes "my informant had killed....great numbers of wild turkeys." "In our excursions we often visited some others of the numerous islands in the Wabash, being particularly attracted by the loud cries of the

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[1] ibid., p. 208 (orig. p. 62).

[2] ibid., XIII, p. 72 (orig. p. 41).

[3] James, Edwin. Account of expedition from Pittsburgh to the Rocky Mountains.... 2 vols. Phila., 1823, Vol. I, p. 32.

[4] Schoolcraft, H. R. Travels in Central Portions of the Mississippi Valley. New York, 1825, p. 71.

[5] Early Western Travels. Vol. XXII, Part I, p. 168 (77), 178 (81), 191(89), 192(90).

wild turkey; their voice is exactly similar to that of the European turkey. We could hear them scratching among the dry leaves on the ground, in search of food. If we surprised them, they were generally too far off for our fowling-pieces, loaded with small shot, for they ran away with extraordinary rapidity. Turkey Island seemed to be a favourite place of resort. At the upper end of the island drifted wood was frequently piled up to such a height, that it was difficult to clamber over it, and among this wood there were generally many otters. Here we often found wild turkeys,....; and it is really a fine sight to see a flock of these wild turkeys fly across the river,...." At Black River, Wabash country, "we were unsuccessful in our chase of the wild turkeys, of which we sometimes saw whole flocks fly across the Wabash."

In 1834, H. R. Schoolcraft in the "Natural History of Michigan," writes that,[1] "The *gallipavo meleagris*, or wild turkey, pursues its food in the vast ranges of the new counties of the peninsula, and is still found in the vicinity of this city. It does not extend its summer migrations to the extremity of the peninsula, and has never been seen north of it." The following year, 1835, Chas. Fenno Hoffman writes,[2] "Here the numerous deer-runways, with the flocks of wild turkeys....showed us that we were upon the favorite hunting-ground of the Pottawattamies." The same year Patrick Shirreff (l. c., p. 434) finds turkeys in endless numbers in Illinois. Four years later, 1838, Jas. Hall records that[3] "Wild turkeys are still abundant. They are shy and difficult to shoot, but our hunters kill great numbers of them. In the spring they are found in pairs, but during the rest of the year in flocks consisting of the old pair and the last brood. Fine turkeys may be bought of the hunters for twelve and a half cents apiece." In 1830–1840 turkeys were plentiful[4] in Michigan. In this region,[5] "A turkey was generally roasted by hanging it up before the fire by a string attached to a beam above. A dripping pan was placed under it and

[1] Schoolcraft, H. R. Historical and Scientific Sketches of Michigan. Detroit, 1834, p. 189.
[2] Hoffman, Chas. Fenno. A Winter in the West by a New Yorker. N. Y., 1835, 2 vols., Vol. I, p. 202.
[3] Hall, Jas. Notes on the Western States. Phila., 1838, p. 124.
[4] Mich. Pioneer and Historical Colls., Vol. 6, p. 475.
[5] ibid., Vol. XIV, p. 436, XIII, p. 548.

it was basted and turned till done. Though cooked by primitive means, a turkey roasted in this manner is equal in flavor to the best that improved methods can produce." Finally, in Michigan we have this note. "Wild turkeys were often seen by the score by the early settlers, and some few have been seen till quite recently (1888). In the Wabash region in 1855 Beste, an Englishman, says,[1] "We met a peasant carrying a rifle over one shoulder, and in the other hand, a black wild turkey."

Missouri, Iowa, and *Minnesota.*

Most of the printed records of the wild turkey in this region come after 1800. When at Lake Pepin, J. Carver in 1766–1768, finds in November,[2] "Great numbers of fowl frequent also this Lake and rivers adjacent,....and in the groves are found great plenty of turkeys and partridges." In 1804, Captain Clarke traversed this region and on one occasion,[3] "went out to hunt and killed a small turkey." In another instance when the party was only 4 days' trip west of St. Louis, the record says, "passed the mouth of Mine River; saw several turkeys on the shores." In 1808–1816, Henry Ker (l. c., p. 40) and his party when on the Mississippi "were visited by a few of the Osark tribe of Indians, who came to us in canoes, bringing with them a few turkies;...." In 1806, Zebulon Montgomery Pike starts on a trip up the Missouri and Osage Rivers, and through Kansas to the Pawnee River on the Republican River. At Gasconade River, July 24, he[4] "killed....three turkeys." Thereafter, they continue to kill turkeys throughout the trip. In one instance he pities some poor fellows to whom he gives whiskey, "they having had only two turkeys for four days."

In 1809–1811, Bradbury says,[5] "With....turkeys, the town of

[1] Beste, J. R. The Wabash; etc. 2 vols. London, 1855. Vol. 2, p. 50.

[2] Carver, J. Travels through the Interior Parts of North America, in the Years 1766, 1767 and 1768. London, 1778, p. 55.

[3] Gass, Patrick. Journal of the Voyage and Travels of....Capt. Lewis and Capt. Clarke....During the Years 1804, 1805, 1806. 4 edit. Phila., 1812, pp. 27, 262.

[4] The Expeditions of Zebulon Montgomery Pike. New edit. Edited by Elliott Coues. N. Y., 1893, Vol. II, pp. 366, 368, 370, 373, 381, 394, 395, 399.

[5] Bradbury, John. Travels in the Interior of America in the Years 1809, 1810 and 1811.... Liverpool, 1817, p. 261.

St. Louis is frequently supplied by a tribe of the Shawnee nation of Indians, who live about seventy miles west of that place. They usually charge a quarter of a dollar for a turkey or a quarter of venison." In 1811, H. M. Brackenridge when not far from Fort Osage up the Missouri writes,[1] "While Castor was out, he saw a *white turkey*, but was not so fortunate as to kill it. I am told that they have sometimes been seen of this color: but I suspect it is Rara avis in terris, nigroque simillima cygno." He finds that, "In the settlements, and for a considerable distance up the Missouri, turkies stalk through the woods, in numerous flocks, but are rarely met with where the open country commences."

In 1812, Major Amos Stoddard holds that[2] "these forests (Upper Louisiana) also according to the best accounts, contain about a hundred and thirty species of birds. The most useful of them are several kind of duck....and turkey."

In 1816, John D. Hunter (l. c., pp. 170, 383, 425, 432) says, "Wild turkey, prairie hens, etc.....are inhabitants of this country." He tells how a band of Indians may often approach a hostile party by gobbling like a turkey cock and their enemies be not aware of their intent or presence. In another instance, he states that when Indians choke, they thrust a turkey feather down the throat to induce vomiting. Finally, he describes at length, the "Soo-ke-He-Ah (or) young turkies' feed." "Turkey pea — There are two highly nutritive articles bearing this name, which grow in the western country in great abundance, but which are entirely different in character from the one now under consideration. One variety is however called by the graziers on the frontiers Pea vine, which from its great abundance and nutritive properties constitute a highly valuable grazing article. The other has a single stock, grows to the height of eight or ten inches, and bears a small pod. It is found in rich loose soils, appears amongst the first plants in the spring, and produces on the root small tubers of the size of a hazelnut, on which the turkies feed.... But the substance now under notice grows to a foot or foot and a half in height, and adorns the

[1] Brackenridge, H. M. Views of Louisiana together with a Journal of a Voyage up the Missouri River in 1811. Pittsburgh, 1814, pp. 216, 59.

[2] Stoddard, Major Amos. Sketches Historical and Descriptive of Louisiana. Phila., 1812, p. 231.

borders of the prairies, where in July it almost uniformly bears a great profusion of beautiful blossoms, which are white, fringed with red on their margins. These are subsequently followed by a luxuriant crop of small peas, of which the wild turkies are extremely fond, from whence their name. . . ."

Shortly after, 1818, H. R. Schoolcraft visits the Osarks. Around the Great and Little North Forks of the White River, he finds that [1] "At the early hours in the morning, the wild turkeys appeared in large flocks, with their plumage glistening in the light." When at Wall-cave valley, November 13, 1818, he says "As the evening approached, a flock of turkeys, coming in from the plain to the top of the cliff above the cavern, flew down on to the trees directly in front of us, sheltered as we were from their sight, and afforded a fine opportunity for the exercise of sportsmanship." Throughout the trip, turkeys suffice for many a meal, and, in one case, Schoolcraft relates the enjoyment of a "turkey-pie, with a crust of Indian meal." The following year, 1819, the same author records that [2] "The wild turkey is still common on the bottom lands, and during the heat of the day in the open post oak woods."

In 1818, Estwick Evans observes the bald eagle and the turkey in the rôles of pursuer and prey.[3] "Whilst in the Missouri Territory, and not far from the bank of the river, a bald eagle, perched upon a tall and blasted oak, attracted my attention. . . . Whilst I was admiring the strength of his form, and the majesty of his aspect, a wild turkey flew from a neighbouring tree and alighted on the ground. The eagle immediately pounced upon his prey; but ere he could effect his object the turkey was shot. I might too, have killed the eagle, but admiration and awe prevented me. I felt that he was the emblem and the inspiration of my country; and at that moment, I would not, for ten thousand worlds like ours, have cut a feather of his wing." In 1820, Stephen Watts Kearny in "A Narrative Account of the Council Bluff, St. Peters Military Expedition" notes that they [4] "passed the Wakendaw River on

[1] Schoolcraft, H. R. Scenes and Adventures in the Semi Alpine Region of the Osark Mountains of Missouri and Arkansas. Phila., 1853, pp. 59, 66, 79, 80, 85, 98, 99, 121.

[2] Schoolcraft, H. R. A View of the Lead Mines of Missouri. New York, 1819, pp. 36, 37.

[3] Early Western Travels, VIII, p. 311 (orig. p. 205).

[4] Mo. Hist. Soc. Colls., III, 1908, p. 52.

the West at which point we saw large flocks of Turkeys." About the same time, Stephen H. Long (l. c., pp. 96, 111, 373) finds that at Franklin on the Missouri, "Most of the deer. . . ., as well as the turkies have fled from this part of the country, though but a few years since they were extremely abundant." and that at Isle au Vache (100 miles above Osage) there were great numbers of turkies.

In 1832, Timothy Flint (l. c., 305, 94) writes that in Missouri "Wild turkeys furnish admirable sport to the gunner" and of the Mississippi at the Falls of St. Anthony he says, "Its broad and placid current is often embarassed with islands, often containing from five hundred to a thousand acres, and abounding with wild turkeys. . . ." The same author in a previous work (1826) finds that[1] "There is a great abundance and variety of wild fowl, and turkeys, . . ." at Jackson, Missouri. In 1832–33, Latrobe records that[2] "Turkeys were plentiful in the woods" of Missouri. About this same time, Maximilian, Prince of Wied, states that[3] "wild turkeys were not often found" at St. Charles on the Missouri. Near Gasconade River, he says "our hunters fired unsuccessfully at a flock of wild turkeys." At Osage on the Missouri, he writes, "Some of my people, attracted by the cries of the wild turkeys, were tempted to land, but returned without having met with any success. I happened to have taken no piece with me, which I much regretted for a wild turkey-cock came out of a bush about ten paces from me, and stood still, looking at me, while his splendid feathers shone in the sun," and at Boyer's Creek near Council Bluffs, he notes "We had a fruitless chase after some wild turkeys." At Missouri City, he finds that "Wild turkeys are still met with." A year later (April 4, 1834), John K. Townsend at Big Spring, Mo., records that[4] "We then gave up the pursuit, and turned our attention to the turkies, which were rather numerous in the thicket. They were shy, as usual, and, when started from their lurking places, ran away like deer, and hid themselves in the underwood.

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[1] Flint, T. Recollections of the Last Ten Years Passed in Occasional Residences and Journeyings in the Valley of the Mississippi. Boston, 1826, p. 248.

[2] Latrobe, C. J. The Rambler in North America. 1832–1833, 2 vols. New York, 1835, Vol. I, p. 100.

[3] Early Western Travels, XXII, pp. 240 (orig. p. 113) 241 (114), 247 (117); XXIV, pp. 107 (465), 120 (472).

[4] ibid., XXI, p. 129 (orig. p. 16).

Occasionally, however, they would perch on the high limbs of the trees, and then we had some shots at them. In the course of an hour we killed four,..." In his Travels 1834–1836, C. A. Murray (l. c., p. 73) notices this form at Keokuk. In 1837, A. Wetmore writes [1] "The game of Missouri, the ranks of which are thinned as settlements advance, consists of..., turkeys etc." In Saline County, he says "Turkeys and grouse here give animation to the prairie scenery and furnish the table with some of the choicest luxuries of life." Finally, in 1846, Wm. J. A. Bradford holds that [2] "The wild turkey is found in great numbers on the wooded bottom lands" of the Upper Mississippi.

Kansas, Nebraska, Colorado and the *Northwest.*

If we do not consider Coronado of the 16th century, the record begins in 1724, when M. de Bourgmont made a trip from Fort Orleans to the Missouris, Canzas and Padoucas. On the 16th of October, 1724, he says [3] "Besides the larger game, these groves (at River of the Canzas) afforded also a retreat to flocks of turkeys."

About the beginning of the nineteenth century, Alexander Henry writes of one of Big Belly Indians [4] "who had a turkey-cock's tail, great numbers of which they get from the Schians, and which serve them as fans." On the return, the Lewis and Clarke expedition when passing down the Missouri River, records the turkey at the mouth of the Platte River.[5] "At two in the afternoon we stopped to hunt, and soon killed two deer and a turkey." Shortly after, Pike takes a trip from a Pawnee Village through Kansas and Colorado to Pike's Peak, October 1–November 30, 1806. At Lamar he says [6] "killed one turkey, the first we have seen since we left the Pawnees"; at Florence, "killed....six turkeys"; at Royal Gorge of the Arkansaw, "Heard 14 guns at camp....found

[1] Wetmore, Alphonse. Gazetteer of the State of Missouri. St. Louis, 1837, pp. 29, 219.

[2] Bradford, Wm. J. A. Notes on the Northwest, etc. New York and London, 1846, p. 19.

[3] Du Pratz, M. Le Page, l. c., p. 69.

[4] Coues, Elliott. The Manuscript Journals of Alexander Henry and David Thompson, 1799–1814. 3 vols. N. Y., 1897, Vol. I, p. 355.

[5] Gass, Patrick. l. c., p. 260.

[6] Pike, l. c., Vol. II, pp. 442, 462, 463, 464, 471, 474.

that cause of my alarm was their shooting turkeys, killed....nine turkeys." Later, at this latter place, he kills others, and, along the Arkansaw, he says he "Saw great quantities of turkeys...." Five years later, 1811, on May 7, Brackenridge (l. c., p. 225) near the mouth of the Platte River, notes "On my return to the boat, killed some pigeons....and saw a flock of turkeys." In 1819 or 1820, Long (l. c., Vol. I, p. 419) when near the sources of the Grand River says "Nothing is more difficult than to estimate by the eye, the distance of objects seen in these plains...., we discovered as we thought, several large animals feeding in the prairie, at the distance of half a mile. These we believed could be no other than bisons, and after a consultation respecting the best method of surprising them, two of our party dismounted and creeping with great care and caution, about one fourth of a mile through the high grass, arrived near the spot, and discovered an old turkey, with her brood of half grown young, the only animals now to be seen." The year following, 1821, Jacob Fowler states that on October 8, near Arkansas River [1] "Some of the Hands killed 10 turkeys." A month later, November 3, 1821, at Hartland, Kearney Co., he notes that "On this island the Hunters killed Some turkeys and Seen Some more. the first We Have SEEN above the little arkensaw...." Finally, on November 17, 1821, he remarks that at La Junta, "no buffelow or turkeys."

In 1833, Maximilian, Prince of Wied, gives us several notes for this region. When near the mouth of the Kansas, he says [2] "He (McKenzie) brought us several turkeys which had been lately shot." At Cedar Island, 1075 miles from the mouth of the Missouri, he holds that "This may be considered the limit to which the wild turkey extends on the Missouri. It is true that this bird is now and then, found higher up, even on the Yellow Stone River; but these are exceptions, for beyond this place the woods are too open and exposed. The Indians on the Upper Missouri, readily barter for the tails of these fine birds to use them as fans and ornaments,

[1] The Journal of Jacob Fowler, etc. 1821–22. Edited by Elliott Coues. N. Y., 1898, pp. 16, 33, 48.

[2] Early Western Travels, XXII, Part I, pp. 251 (Orig. p. 119) 296 (144); XXIII, Part II, pp. 102 (249), 103, 261 (339); XXIV, Part III, pp. 74 (446), 109 (465), 226, 248, 275, 276, 285, 293, 295, 300.

and Mr. McKenzie, accordingly took a great supply with him." Of this trade with the Black feet Indians, he says, "The Company now sends to its trading posts, the tail of the wild turkeys, which are much in request" for fans. At Mandan, N. D., he asserts that "For an arrow wound he (Indian) fastened in his hair the wing feather of a wild turkey." At old Fort Clarke, he discovers dogs gaily clothed with feathers. "In the middle of this mass of feathers, the outspread tail of a wild turkey....was fixed." Near Weeping Water, Kansas, he frequently espies turkies. He states that "We set out early and passed Weeping-water River, landing several times to pursue the wild turkeys, whose note attracted us to their retreats. We often saw these proud birds in the lofty trees, perched up beyond the reach of small shot." Finally, he gives the following Indian names for the wild turkey:

Dacota (Sioux)	sisitscha-kanka (*s* soft; *kan* in the throat).
Mandans	máhnu (*a* rather full, almost as if with superior *o*).
Minnitanis or Grosventres	sihs-kichtia (run together; *ich* with the point of the tongue; *ti* and *d* separated).
Omahas	sihsikah.
Oto	wæ-ink-chontjeh (first e barely audible; *ch* guttural; *j* French).
Saukis, Sakis, Sacs	pänáh (first *a* umlaut).
Wasaji or Osage	suhka.

In 1833, September 25, Nathaniel Wyeth in his trip to Oregon, reports killing a turkey just west of Black Snake Hills and Rubideau Fort. In another place, he says he saw several turkeys.[1] A short time later, C. A. Murray (l. c., Vol. II, 45) records that at the mouth of the Kansas River "A lad (of the company) took a ramble with his fowling-piece, and saw some turkeys,....but he could not get near enough for a shot." In 1837, Washington Irving writes that[2] "An Indian trader, well experienced in the

[1] Young, F. G. The Correspondence and Journals of Captain Nathaniel J. Wyeth, 1831–36. In Sources of the History of Oregon, Vol. I, Parts 3–6, pp. 217, 218.

[2] Irving, Washington. The Rocky Mountains; etc. 2 vols., Phila., 1837, Vol. I, p. 38.

country, informs us that within ten years that he has passed in the far west, the bee has advanced westward above a hundred miles. It is said on the Missouri, that the wild turkey and the wild bee go up the river together: neither are found in the upper regions. It is but recently that the wild turkey has been killed on the Nebraska, or Platte and his travelling competitor, the wild bee appeared there about the same time." A few years later, Fremont on the Little Blue River (Neb.?) describes it as follows:[1] "The stream was about fifty feet wide and three or four feet deep, fringed with cottonwood and willow, with frequent groves of oak tenanted by flocks of turkeys."

In 1846–1847, the Emory Reconnoisance meets the wild turkey on several occasions. Of the Valley of Purgatory, the report has it that[2] "the hills are bare of vegetation, except a few stunted cedars; and the valley is said to be, occasionally, the resort of grizzly bear, turkeys...." In Lieutenant Abert's Appendix of this report are several notes on this form. He gives it amongst the birds seen from Bent's Fort to Santa Fe, and holds "our road leads through a region that abounds with the deer....and the turkey." Along the Purgatory River, "dense thickets, composed of plum and the cherry interwoven with grape vines, formed impenetratable thickets, where....wild turkey, found a secure shelter." Here "turkeys are very abundant," and, "they told us that....they daily killed great numbers of....turkeys." Also at Wakaroosa river, Kansas, he records that "Some of our hunters went out and killed several wild turkeys (Meleagris gallopavo.)" In 1848, J. Q. Thornton says the wild turkey is found east of the Nebraska River.[3] In "The Overland stage," Messrs. Root and Connelley assert that[4] "There was an abundance of wild game in the '60's. In eastern Kansas large numbers of wild turkeys.... were seen. Along the Little Blue River there were also many wild

[1] Fremont, J. C. Rept. of Exploring Expedition to the Rocky Mts. in the year 1842 and to Ore. and North California in the years 1843–1844. Washington, 1845, p. 15.

[2] Emory, W. H. Notes of a Military Reconnoisance from Fort Leavenworth in Missouri to San Diego, in California, etc. New York, 1848, pp. 21, 405, 432, 437, 439, 524, 390.

[3] Thornton, J. Q. Oregon and California in 1848. N. Y. 1855, Vol. I, p. 41.

[4] Root, F. A., and Connelley, W. E. The Overland Stage to California. Topeka, Kansas, 1901, p. 87.

turkeys." Finally, in 1868, Zincke finds that[1] "As to feathered game; on lucky days you may get a wild turkey," in the Rocky Mts.

Arkansas, Oklahoma, Texas and the *Southwest.*

In this, the last section to be considered, the turkey has always been a familiar form from Coronado's day to the present. In 1723, Bernard de la Harpe finds it in the land about the Red River and asserts that the country of the Arkansas and Tayas has an abundance of turkeys.[2]

Some hundred years later, 1818, Schoolcraft remarks[3] the cheapness of wild turkeys at 25 cents in the White River country of Arkansaw Territory, and, in 1817, Brown (l. c., p. 174) tells how "50 miles from its mouth (Grand Saline or Newsewketonga) the prairie grass is encrusted with salt; the Indians collect it by scraping it off the prairie with a turkey's wing, into a trencher." The following year, 1819, Thos. Nuttall in "Travels into the Arkansas Territory" discusses the feather mantles of the Osage Indians.[4] "Nearly all those whom De Soto found inhabiting Florida and Louisiana, on either side of the Mississippi,.... dressed themselves in woven garments made of....; and in colder seasons of the year, they wore coverings of feathers, chiefly those of the turkey. The same dresses were still employed in the time of Du Pratz. These feather mantles were, within the recollection of the oldest men, once used by the Cherokees, as I learnt whilst among them. There is, therefore, nothing extraordinary in the discovery of these garments around the bodies which had been interred in the nitre caves of Kentucky. Presents of these 'mantels' as they are called by Purchas, now superceded by European blankets, were perpetually offered De Soto, throughout the course of his expedition, and are still made use of by the natives of the north west coast."

In the southwestern country, the Long expedition 1819–1820, encounters the turkey frequently. In the Arkansas River system,

[1] Zincke, T. B. Last Winter in the United States. London, 1868, p. 250.
[2] French, B. F. l. c., Part III, pp. 69, 74.
[3] Schoolcraft, H. R. A View of the Lead Mines,.... p. 251.
[4] Early Western Travels. XIII, pp. 258–259 (orig. pp. 193–194).

the hunters were regularly sent out for it and often returned with as many as seven. In the Red River region the [1] "game grew so abundant, that we had it at any time in our power, to kill as many bison.... and turkies, as we might wish." "The grapes and plums so abundant in this portion of the country are eaten by turkies...., as we conclude from observing plumstones in the excrement of these animals." In the Pawnee territory, they record this form and at the Falls of the Canadian River (near Great North Fork). "Turkies were very numerous." On the Red Fork, they find "a seasonable supply of four turkeys." Some years later, Timothy Flint tells how James O. Pattie of Kentucky [2] "saw (in 1824) great numbers of.... turkeys" in Socoro County, N. M. In the beginning of 1825, he reports fat turkies along the banks of San Francisco River and along its tributary, Bear Creek.

In 1826, W. B. Dewees at San Antonio de Bexar, Texas, says [3] "On the first evening, we encamped about an hour before sundown, and my friend and myself strayed away from the camp for a short time and while absent, succeeding in killing a couple of very fine turkeys.... we had driven them to take refuge in a tree, where we had shot them with our rifles." In 1832–33. Latrobe (l. c., Vol. I, pp. 142, 143, 160, 166) finds that "turkeys.... were plentiful in the vicinity of the camp (Western Creek Agency at Saline near Verdigris River),.... so that abundance reigned there." At Bald Hill near Arkansas, he says "We noticed the tracks of innumerable .... turkeys,...." On the Red Fork, he notes an "abundance of turkeys." On the North Fork of the Canadian River, he claims that they "killed in its neighborhood.... twenty turkeys,...." Finally, his last note is of the Arkansas River which is "frequented by.... turkeys." "A Visit to Texas, etc. New York, 1834" records (pp. 92, 209) that "There are wild turkies and smaller birds." "The turkies chiefly resort to the woods." Its author on a trip from Brazona to San Felipe tells how they "had plenty of.... wild turkey,...." In 1836, Edward, in his list of birds, writes [4]

[1] James, Edwin. l. c., Vol. II, pp. 49, 59, 63, 118, 119, 127, 141, 155, 159, 217, 225.

[2] Early Western Travels. XVIII, pp. 86 (52) 88 (54) 90 (55) 108 (71).

[3] Dewees, W. B. Letters from An Early Settler of Texas. Compiled by Cora Cardelle, Louisville, Ky., 1852, Letter IX.

[4] Edward, David B. The History of Texas; etc. Cincinnati, 1836, p. 75.

"Among the birds fit for food, are the wild turkey, (commonly found in the woods, and near the edges of the prairies)...." In 1837–1838, Daubeny records at Little Rock, Ark., that he [1] "saw two wild turkies on Saturday, but at too great a distance to give us a chance of shooting either." On a trip from Little Rock to Hot Spring, April 11, he writes, "we accompanied our host in a chase after a wild turkey, which I had a great ambition to kill and stuff for our Museum at Oxford. The females were decoyed by imitating the gobble of the turkey-cock, in which the back settlers are very expert, but on this occasion the strategem was tried unsuccessively; for though we saw several, and chased them through the wood, we never got within gunshot of any one. My man made several other attempts, but always in vain.

In Josiah Gregg's "Commerce of the Prairies" we have under "Animals of the Prairies" the following:[2] "About the Cross Timbers and indeed on all the brushy creeks, especially to the southward, are quantities of wild *turkeys* which are frequently seen ranging in large flocks in the bordering prairies." Westward of Spring Valley near the Canadian, he says "every nook and glade swarmed with deer and wild turkeys,...." In another instance he states that "In some of the mountains (of New Mexico), wild turkey are very numerous." In 1847 (January 14), Abert's party of the Emory expedition (Emory, l. c., p. 505) "saw wild turkeys" at Valverde, New Mexico. In 1849, R. B. Marcy reports that on the Divide near the Canadian River,[3] "We have seen many antelopes and turkeys during the last few days." Seventeen days later in June, he reports for the Canadian river region; "I killed a turkey this evening, which is the first we have seen for a week."

The following year the report of S. G. French appears and therein he notes that [4] "It might be well to remark that, in all the streams between San Antonio and the San Pedro, fish are abundant, and that in their vicinity deer and turkeys are found." About the

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[1] Daubeny, Charles. Journal of A Tour through the United States and in Canada, Made During the Years 1837–38. Oxford, 1843, pp. 154, 157.

[2] Early Western Travels. XX (orig. Vol. II) pp. 282 (232), 115 (28), XIX (orig. Vol. I), pp. 328 (195), 325 (191).

[3] Marcy, R. B. l. c., pp. 179, 183.

[4] French, S. G., Report of. From Reports of Reconnaissances of Routes from San Antonio to El Paso. 31st Congress, 1st Sess. Ex. Doc. No. 64, 1850, p. 52.

same time, Washington Irving makes several notes of the turkeys in this southwest country. In the Osage country, he records it and also along the Arkansas River. At the Red Fork, he finds [1] "a number of turkeys." Later, he says the party "came to a halt, in a beautiful grove of elms, on the site of an old Osage encampment. Scarcely had we dismounted when a universal firing of rifles took place upon a large flock of turkeys, scattered about the grove, which proved to be a favorite roosting-place for these simple birds. They flew to the trees, and sat perched upon their branches, stretching out their long necks, and gazing in stupid astonishment, until eighteen of them were shot down." In Deep Creek or Little North Fork, he writes, "The rich woody bottom in which we were encamped, abounded with wild turkeys, of which a considerable number were killed."

In his "Expedition from Texas to Santa Fe," George William Kendall frequently encounters turkeys. At San Antonio, Texas, he reports [2] "We put up two or three turkeys near the branch, but the underbrush was so thick it was impossible to get a shot at them." Of the valley of the Brazos, he says that it "teemed in every species of game....elk,...., wild turkeys,...." On the Red River, he speaks of them at length. "We continued our march until we reached the dry bed of a mountain stream, upon the banks of which we encamped for the night. A flock of wild turkeys had taken shelter under the banks, running off as we approached their roost. Although contrary to strict orders, nothing could restrain our men from banging and blazing away at the turkeys as they sped across the prairie — fifty rifles and muskets being discharged at them before they were out of sight. Two or three only were killed by the volley and running fire which ensued and they were but half grown, and so extremely poor that they did not furnish a meal for half a dozen men." Of the same region, he again writes, "By-and-by a brood of wild turkeys, which had been hunting for their supper at the base of the rocky steeps, flew over our heads, and sought their roost in a large cotton-wood which overhung the river.

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[1] Irving, Washington. The Crayon Miscellany. Revised edit. New York, 1861, pp. 49, 68, 70, 108, 133, 134, 157, 191, 194.

[2] Kendall, George William. 2 vols. N. Y., Vol. I, pp. 54, 102, 256, 260.

The sharp crack of a rifle soon announced the doom of one of the flock,. . . ."

In 1860, Domenech tells us that in the western part of Texas between the Rio Seco and Rio Blanco[1] "Partridge, quail, wild turkeys. . . .have made of this spot their favorite sojourn." Ten years later, 1870, William A. Bell reports that at Turkey Mountain (not far from Las Vegas)[2] "the wild turkeys had all been either shot or driven away by the officers of Fort Union." Lastly, H. M. Chittenden remarks that[3] "on the lower Missouri and in the south west the wild turkey abounded, and was extensively used for food" in the days of the early fur trade of the West.

In this recital, the effort has been to interweave these early records without paraphrase. At times they are decidedly ungrammatical, some bordering on fiction, others bizarre in the extreme; yet they all ought to be added to the turkey literature and may supplement the material so frequently rehashed in recent years.

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[1] Domenech, Abbe Em. Seven Years' Residence in the Great Deserts of North America. 2 vols. London, 1860, Vol. I, p. 134.

[2] Bell, Wm. A. New Tracks in North America. 2nd edit. London, 1870, p. 122.

[3] Chittenden, H. M. The American Fur Trade of the Far West. 3 vols. N. Y., 1902, Vol. II, p. 835.

GENERAL NOTES.

The Red-throated Loon (*Gavia stellata*) **in Jackson Park, Ill.**— On February 21, 1915, where the waters of the Yacht Harbor join those of Lake Michigan in Jackson Park, a specimen of the Red-throated Loon in winter plumage was seen. The weather was rather cool, being from 48° to 51° Fahrenheit. A light steady rain was falling with a moderate southeast wind. The bird had a badly hurt left leg and wing. These injuries prevented it from diving, for this would naturally be the first thing to which it would resort upon being frightened. As it could neither fly, dive, nor swim rapidly, we were at times within ten feet of it and directly above it.

The Red-throated Loon is considered an unusually rare winter visitant here. 'Birds of Chicago Area' (Woodruff, 1907) gives the following notation regarding this species: "The Red-throated Loon seemingly can be admitted to the bird fauna of the Chicago Area only as a rare winter visitant." As far as we have learned this is the only record for Jackson Park, although it is quite possible that others have been seen in previous years.— L. L. Mackenzie, W. W. Lyon, *Chicago, Ill.*

Another European Widgeon in Virginia.— On Christmas Day, 1914, Messrs. Chas. J. and Laurence Rumsey, of Ithaca, N. Y., were duck-hunting at Virginia Beach, Va. After the main flight of the morning was over, a single bird came to the decoys and was shot. This bird proved to be a first-year male European Widgeon (*Mareca penelope*). It was in nearly complete winter plumage, though the back and flanks were still rather plentifully sprinkled with the dull feathers of the post-juvenal plumage, and the white wing-spot was only suggested by one white covert in each wing. The specimen was fortunately saved and presented to me, and is now in my collection.

This note is submitted for record as it is interesting to know whether or not this European species is becoming increasingly abundant in America. Two others,— Princess Anne Co., Va., January 5, 1915, and Currituck Co., N. C., January 27, 1915, are recorded by Mr. H. H. Bailey in 'The Oologist' for March, 1915.— Louis Agassiz Fuertes, *Ithaca, N. Y.*

Snow Geese and Swans in Massachusetts.— On November 20, 1914, five Lesser Snow Geese (*Chen h. hyperboreus*) were shot at Robbin's Pond, East Bridgewater. These birds, two adults and three young, were mounted by C. Emers onBrown. Three other Snow Geese are said to have been taken at Robbins Pond in 1913.

On November 21, two swans were seen by the gunners at Oldham Pond, Pembroke. They circled around a number of times and then headed towards Silver Lake where they were also seen.— J. C. Phillips, *Wenham, Mass.*

Wilson's Snipe Wintering in Nova Scotia.— Mr. R. W. Tufts of Wolfville, Kings County, Nova Scotia sent me a Wilson's Snipe (*Gallinago delicata*) which he shot at Wolfville, February 17, 1915. He said this bird (which proved to be a male) was discovered in a sheltered spring swamp or bog, which never wholly freezes and where the grass shows green even in the severest winter weather. The bird was in fine condition, being well protected with fat.— JOHN E. THAYER, *Lancaster, Mass.*

Spotted Sandpiper and Water.— In 'The Auk' for April, 1915, p. 227, Mr. L. L. Jewel speaks of a crippled Spotted Sandpiper (*Actitis macularia*) diving and swimming under water. I have found this to be a regular habit in young of the species at Mastic, Long Island. I remember distinctly the last one I banded at this place, a bird not yet able to fly, which, when pursued took to the water. I reached down and grabbed it below the surface where it was swimming with its wings.

In this connection I would like to relate a boyhood experience which I do not remember ever to have published. While crossing a small bay at Far Rockaway, Long Island, a Spotted Sandpiper was observed flying excitedly about close to the surface. Its actions were inexplicable until suddenly a hawk swooped to it from out of the sky somewhere. The Sandpiper dropped upon the surface where it lay limp as though dead. After making one or two more unsuccessful swoops the hawk departed. When approached the Sandpiper first sat up like a little duck, then rose and flew ashore.— J. T. NICHOLS, *New York City.*

Gray Sea Eagle off Nantucket.— I should like to record what appears to be the "farthest south" record for the Gray Sea Eagle (*Haliæetus albicilla*). This bird, which is in immature plumage, flew aboard the Dutch steamer 'Arundo,' as she was passing Nantucket light ship, on November 14, 1914. It was secured alive by the captain, and is now living in the New York Zoölogical Park.— LEE S. CRANDALL, *Assistant Curator of Birds, N. Y. Zoöl. Park.*

Young Kingbirds on a Cherry and Dragon-fly Diet.— I was watching a pair of Kingbirds feeding their young in a nest built in a pine about fifteen feet from the ground. A telephone wire passing nearby furnished a temporary resting place for the parent birds, and at the same time gave me an excellent opportunity of noting the various kinds of insects which were dropped into the gaping mouths of the young birds about ten or twelve days old. The exact species of insects could not be identified, but among various kinds of flies, moths and butterflies, to my amazement a large green dragon-fly with great head and eyes, measuring across the wings at least four inches, was jammed wings and all, into the mouth of one of the little ones. After a few moments, as if for dessert, a large red cherry fully one-half inch in diameter was rammed home in the same manner, and

in another minute or two another cherry met a similar fate. I watched these birds with some curiosity, and saw them about four days later leaving the nest apparently all well, and none the worse for the strenuous ordeal.— Wm. L. Baily, *Ardmore, Pa.*

The Bohemian Waxwing (*Bombycilla garrula*) at Ithaca, N. Y.— While walking over the campus of Cornell University at noon on November 28, 1914, we observed a flock of about a dozen Cedar Waxwings in a group of trees that included a berry-laden mountain ash (*Pyrus americana*). An hour later we had stopped to watch the birds again, and were discussing the points of difference between the notes of our two species of Waxwings. At that moment the characteristic notes of *Bombycilla garrula* most opportunely caught our attention, and their author was presently distinguished among the rest of the Waxwings by means of its larger size and its white wing markings. In order that others might share in the pleasure of seeing such an unusual visitor, we summoned by 'phone Messrs. A. A. Allen, L. A. Fuertes, and A. H. Wright, and all were enabled to make observations on the bird under very favorable conditions.

Its actions accorded with the proverbial gentleness and amicability of the Waxwings. It allowed a Cedar Waxwing to perch beside it and feed upon the same cluster of mountain-ash berries; and twice a berry seemed to be passed from one to the other. It was somewhat restless, and once it circled swiftly around a nearby house, swerving from side to side in an erratic course suggesting that of a Teal.

The following prominent characters served to distinguish the Bohemian Waxwing from the other species in the field: its larger size; the white markings in the wing, conspicuous whether the bird is flying or at rest; the larger patch of black on its chin; its generally grayer coloration; and its chestnut-rufous under tail coverts.

Furthermore, its notes are very diagnostic. Though similar in general form to the "beady notes" of *B. cedrorum*, they are less shrill, are more leisurely uttered, and have a more noticeable rolling sound. They are also more distinct, there being a comparatively greater interval between each syllable in the series. The call has been represented by Seebohm as *cir-ir-ir-ir-re* (quoted in Sharpe's 'Hand-book to the Birds of Great Britain,' Vol. I, p. 177) and by Cameron as *zir-r-r-r* ('The Auk,' Vol. XXV, 1908, p. 47), but neither rendering seems to express exactly the decidedly sibilant quality of *each* syllable.

The bird was collected by Dr. Allen, and sketched in the flesh by Mr. Fuertes. It proved to be an adult male in full plumage. The skin has been placed in the collection of the Cornell University Museum. This is the first specimen recorded from the Cayuga Lake Basin.

On the following morning another Bohemian Waxwing was reported in the same place by Mr. H. H. Knight.— Ludlow Griscom and Francis Harper, *Ithaca, N. Y.*

Prothonotary Warbler at South Vineland, N. J.— On June 19, 1914, while studying birds in the Maurice River swamp, about two miles west of South Vineland, New Jersey,— a swamp with which I have been long familiar — I had the pleasure of observing a Prothonotary Warbler (*Protonotaria citrea*) under conditions which left no doubt as to the bird's identity. For several seasons past I had observed a male Redstart (*Setophaga ruticilla*) during the month of June in a certain portion of the swamp and went there on this occasion to determine whether or not this species was breeding. On arriving at the spot I not only found the male Redstart but also the female and soon noticed the latter carry food to its young — a bird just able to fly — in a small water birch tree near by. The Redstarts kept up an incessant chirping and soon other birds in the neighborhood joined in with their notes of alarm, creating quite a disturbance. Presently a new note was heard, well back in the swamp, which I took for the alarm call of the Water-Thrush (*Seiurus n. noveboracensis*) although I knew that it was hardly probable that such was the case, it being far too late for such an occurrence. I waited quietly; the bird continued chirping and drawing nearer, and I was soon able to see the bright yellow bird at a distance of about fifteen feet. I observed it for a number of minutes while it continued to hop about and utter its Water-Thrush like note of alarm. The bird appeared quite excited and I searched a number of likely looking stumps for a nest but without result, nor did I see more than one bird. After a short time the bird disappeared in the thick undergrowth. I was positive that I had seen a Prothonotary Warbler which I believe is a very rare bird in this locality, and on looking the matter up in Chapman's 'Warblers of North America' found that the alarm note of this species is very difficult to distinguish from that of the Water-Thrush and this fact I think cleared up any possible doubt as to the bird's identity. The only other bird inhabiting this region that could possibly be mistaken for the Prothonotary is the female Hooded Warbler and although this bird has a very sharp note of alarm it does not in the least resemble that of the Water-Thrush.

The swamp at the place mentioned extends for about a quarter of a mile on each side of the river. The vegetation of course is, like that of all south Jersey streams, very thick and difficult to explore. The warbler was observed in that portion quite close to the river which is covered most of the time with a few inches of water although during droughts it is comparatively dry, with water in small pools only.— JULIAN K. POTTER, *Camden, N. J.*

Brown Thrasher Wintering in Mass.— There are one or two records of the Brown Thrasher (*Toxostoma rufum*) having been seen in Massachusetts late in the winter or during one month of the winter. On January 3 I saw an individual, which I took to be a male, sitting in some low bushes beside the Boston and Albany R. R. tracks on the Brookline side of the Parkway near the Longwood station. He seemed to be in good

health and while secretive was fairly tame and up to the present writing (February 28) he has remained within a hundred yards of the place where I first found him. A pair of Thrashers nested here last summer and, I suppose, it is more than likely this bird was one of the pair. There has been cracked corn scattered near the thicket in which he makes his home and there is a large chunk of suet in a tree near by, but I have not seen him touch either, and have watched him scratching among the dry leaves and feeding on the ground. Several friends have seen and watched the Thrasher with me. The following are the dates on which I have seen him.: January 3, 14, 17, 24, 31, February 7, 12, 21, 28.— CHARLES B. FLOYD, *Brookline, Mass.*

Birds Observed in Trinity Churchyard, New York City.— While in New York on October 15, 1914, I attended the noon day peace services at old Trinity Church, after which I took a stroll about the churchyard, and noted the following birds contentedly feeding undisturbed by the noise and bustle of lower Broadway:—

Junco.— Two Juncos observed in company of a small flock of English Sparrows feeding on the lawn.

White-throated Sparrow.— One seen scratching among the dead leaves, under some shrubbery.

Song Sparrow.— One observed feeding on the ground, under the shrubbery.

Hermit Thrush.— Three seen running about on the ground or perched on top of a tombstone.

Brown Creeper.— One observed diligently scrambling up an old scarred and weather-beaten tombstone, peering into every crack and crevice for some tender morsel.

Overshadowed by "sky-scrapers" and flanked by surface and elevated street cars, Trinity Churchyard is about the last place one would expect to find any birds other than English Sparrows.— JOS. E. GOULD, *Norfolk, Va.*

Type Locality of Lewis's Woodpecker and Clarke's Nutcracker.— In looking through the 'Original Journals of the Lewis and Clark Expedition' edited by Dr. R. G. Thwaites (1905), I find several mentions of Lewis's Woodpecker and Clark's Crow on the journey out to the Pacific. Then on the return trip under date of May 27, 1806, when encamped on the northeast side of the Kooskooske River west of the Bitter Root Mts. in Idaho, Lewis writes as follows: "The Black Woodpecker which I have frequently mentioned and which is found in most parts of the Rocky Mountains as well as the Western and S. W. mountains, I had never an opportunity of examining until a few days since when we killed and preserved several of them." An excellent description follows.

In the entry of the following day at the same place he writes "Since my arrival here I have killed several birds of the *corvus* genus of a kind

found only in the rocky mountains and their neighborhood. I first met with this bird above the three forks of the Missouri and saw them on the heights of the Rocky Mountains but never before had an opportunity of examining them closely, the small *corvus* described at Fort Clatsop is a different species, [= *Perisoreus*] though until now I had taken it to be the same, this is much larger and has a loud squawling note something like the mewing of a cat." A good description follows.

As Alexander Wilson described these birds from specimens brought home by the expedition it follows that the locality where the specimens were shot becomes the type locality not that at which the species were first seen, as given in the A. O. U. Check-List.— WITMER STONE, *Acad. Nat. Sciences, Philadelphia.*

RECENT LITERATURE.

Levick's 'Antarctic Penguins.'[1]—Since the return of the various Antarctic expeditions of the last few years the general public, through lectures, motion pictures and publications, has come to have a better knowledge of the life history of Penguins, than most of the best informed ornithologists possessed a decade ago. The life history of these curious birds is well worthy of the attention it has received and cannot help but fascinate all who are interested in the study of wild life. Dr. G. Murray Levick who accompanied Capt. Scott on his ill-fated expedition has presented the story of the Penguins in a most attractive way in the little volume before us, based on his experiences with the Adelie Penguins (*Pygoscelis adeliæ*) at Cape Adare. The book is well written, well printed and illustrated by 74 admirable half-tones from photographs.

What corresponds to the 'spring' migration of the Penguins began on October 13 when the first arrival from the north reached the breeding ground, and in the course of a week thousands upon thousands of the curious birds had landed and waddled across the ice and snow to the rookery many of them ascending a thousand feet to the highest part of Cape Adare.

The Adelie Penguin builds a nest of pebbles upon which the two eggs are laid and incubated alternately by the parent birds. Until this time neither males or females leave the rookery and consequently get no food though the males eat snow from adjacent drifts. The fasting period lasts 27 days or more, and afterwards there is a continuous stream of dirty incubating

[1] Antarctic Penguins. A Study of their Social Habits. By Dr. G. Murray Levick, R. N., Zoologist to the British Antarctic Expedition (1910–1913). New York: McBride, Nast & Company, 1914. 8vo, pp. 1–140, figs. 1–74. $1.50 net.

birds waddling down to the water, nearly half a mile distant, and fresh, clean birds coming back from their bathing and feeding to take their turns on the nests. When the young are hatched the parents have the double task of feeding themselves, and carrying back food enough for their rapidly growing chicks, and to quote Dr. Levick " so distended were their stomachs that they had to lean backward as they walked to counterbalance their bulging bellies." The young of course are fed by regurgitation directly from the stomach of the parent. Dr. Levick presents most interesting accounts of the mating, fighting, stealing of building material and other activities of the rookery as well as the actions of the birds in the water, their diving and leaping in and out onto the ice, and their play on the ice cliffs and floes. The birds showed no fear of man and one could walk through the rookery at pleasure.

The student of animal behavior will find much interesting material in Dr. Levick's book and many interesting statements are accompanied by most convincing photographs of the birds going through their performances. Probably no birds offer such opportunities for the study of nesting communities and of the peculiar habits that have arisen from the close association of such multitudes of individuals.

An appendix describes the Skuas (*Megalestris maccormicki*), and their habits — those robbers of the rookeries who depend largely for food upon the eggs and young which an inadvertent parent Penguin may leave for a moment unguarded. There is also a short account of the Emperor Penguin (*Aptenodytes forsteri*).

Altogether Dr. Levick's book is unique, and will appeal to all ornithologists,— whether their specialty be, habits, behavior, oölogy or photography — as well as to the public at large for whom these strange, erect, man-like little birds have a strange fascination.— W. S.

Miller on Ptilosis, with Special Reference to the Feathering of the Wing.[1] — Mr. Miller is doing excellent work on the structure of birds with regard to their systematic relationship. We shall need much additional data before a satisfactory classification shall be drawn up and any facts on comparative structure are welcome. In the present paper he considers the ptilosis of the wing in various birds which have been received in the flesh from the New York Zoölogical Park. Many points of interest are brought out which contradict current statements, as for instance the presence of an aftershaft in some parts of the plumage of the Osprey, the absence of which was considered a subfamily character, and the absence of the eleventh primary in the Pigeons, a group said by Gadow to possess eleven primaries. In commenting upon relationships Mr. Miller also calls

[1] Notes on Ptilosis with Special Reference to the Feathering of the Wing. By W. DeW. Miller. Bull. Amer. Mus. Nat. Hist., XXXIV, Art. VI, pp. 129–140. March 19, 1915.

attention to color combinations the importance of which as a character has been several times emphasized by the reviewer.

In his remarks on the ptilosis of *Podargus* and the *Trochilidæ* we notice no reference to the papers of Dr. Hubert Lyman Clark in 'The Auk,' 1901, p. 167 and 1906, p. 68. Mr. Miller will find some of his statements already recorded there. While it is satisfactory to have previous work verified, reference should be given to it, and we think these two papers must have escaped Mr. Miller's eye.

In a footnote on p. 134 occur some comments on generic names of Parrots. Among other things Mr. Miller fails to see how the names proposed by Kuhl for "sections" of certain genera can be rejected as has been advocated by Mr. Gregory Mathews (Novitates Zool., XVIII, p. 11). We heartily agree with Mr. Miller that no distinction can be made between subgenera and "sections" and that these names must be recognized. In the case of *Conurus*, however, Mr. Miller apparently overlooked the fact that, as Mr. Mathews explains, Lesson fixed as the type of this genus a species of *Palæornis*, which action transfers the name *Conurus* to this old world group necessitating the adoption of *Aratinga* for the South American Conures.— W. S.

Cory on New South American Birds.[1] — Mr. Cory describes twenty-one new forms in the present paper, based on material obtained by the various Field Museum South American expeditions. They are as follows: *Crypturus tataŭpa peruviana* (p. 293), Central Peru; *Nothoprocta ambigua* (p. 293), Otusco, Peru; *Odontophorus plumbeicollis* (p. 294), Ceara, Brazil; *Columba rufina andersoni* (p. 294), Boa Vista, N. Brazil; *C. r. tobagensis* (p. 295), Tobago; *C. plumbea propinqua* (p. 295), Moyobamba, Peru; *C. subvinacea zulliæ* (p. 295), Zulia, Venezuela; *Aramides cajanea venezuelensis* (p. 296), Encontrados, Venezuela; *A. c. peruviana* (p. 296), Moyobamba, Peru; *Cerchneis sparverius peruviana* (p. 296), Chachapoyas, Peru; *C. s. distincta* (p. 297), Boa Vista, Brazil; *C. s. margaritensis* (p. 297), Margarita Island; *C. s. ochracea* (p. 298), Colon, Venezuela; *Otus choliba margaritæ* (p. 298), Margarita Island; *Speotyto cunicularia arubensis* (p. 299), Aruba Island; *S. c. beckeri* (p. 299), Bahia, Brazil; *S. c. intermedia* (p. 300), Pacasmayo, Peru; *Podager nacunda minor* (p. 300), Boa Vista, Brazil; *Nyctidromus albicollis obscurus* (p. 301), Yurimaguas, Peru; *Caprimulgus hirundinaceus crissalis* (p. 301), Bahia, Brazil; *Threnetes longicauda* (p. 301), Ceara, Brazil.— W. S.

Shufeldt on the Tree Ducks.[2] — This paper consists of an extended description of the skeleton of *Dendrocygna* compared with those of certain

[1] Descriptions of New Birds from South America and Adjacent Islands. By Charles B. Cory. Field Mus. Nat. Hist. Publ. 182, Ornith. Series, Vol. 1, No. 8. February 23, 1915, pp. 293–302.

[2] Contribution to the Study of the "Tree-Ducks" of the genus Dendrocygna. By R. W. Shufeldt. Zool. Jahrbüch. 1914, pp. 1–70, pll. 1–16.

ducks, geese and swans. The author's conclusions are the same as those he reached on a previous occasion, being those held by "the most eminent ornithologists and avian taxonomers of the Old World" — that *Dendrocygna* belongs with the ducks and not with the swans or geese with which the A. O. U. Check-List associates the genus. Dr. Shufeldt's criticism of the classification of the latter work shows that he has not read the preface where the reasons for maintaining the original sequence of groups are given. A "Check-List" need not be a "Phylogenetic System" and the A. O. U. Committee clearly states that the sequence followed does not represent present day classification. No less than 14 double page half-tone plates of the osteology of *Dendrocygna* and allied genera are used in illustration of Dr. Shufeldt's paper as well as two crude colored plates of tree ducks.— W. S.

Shufeldt on Fossil Birds in the Marsh Collection.[1]— In this paper Dr. Shufeldt presents the results of his studies of the avian fossils in the Marsh collection in the Yale University Museum and certain of Marsh's types of fossil birds in the Academy of Natural Sciences of Philadelphia. Prof. Marsh left much material unidentified and from this Dr. Shufeldt has described a number of new forms. viz: *Telmatornis rex* (p. 27), New Jersey Cretaceous; *Botauroides* (gen. nov.) *parvus* (p. 33), *Eoceornis* (gen. nov.) *ardetta* (p. 39), *Falco falconella* (p. 40), and *Grus marshi* (p. 41), all from the Eocene of Wyoming; *Colymbus oligoceanus* (p. 54), *Larus pristinus* (p. 54), *Limicolavis pluvianella* (p. 55), and *Phalacrocorax marinavis* (p. 56) from the Oligocene (?) of Oregon; *P. mediterraneus* (p. 58) and *Phasianus americanus* (p. 58) from the Oligocene of Colorado and Oregon respectively; *P. mioceanus* (p. 60), Nebraska Miocene, *Sula atlantica* (p. 62), New Jersey Miocene, *Tympanuchus lulli* (p. 69), Postpliocene of New Jersey; *Colinus eatoni* (p. 70), Kansas, *Gavia pusilla* (p. 70), Wyoming (?), *Phasianus alphildæ* (p. 71), Wyoming, the last three with no horizon recorded. A new genus *Minerva* (p. 43) is proposed for *Aquila antiqua*.

Dr. Shufeldt has added materially to the list of North American fossil birds, but there are two nomenclatural points in his valuable paper that call for comment. One is the naming "provisionally" a species *Colymbus oligoceanus*. After the numerous discussions of rules of nomenclature that have been going on of late years we thought that one point was pretty generally understood, i. e. that it was impossible to name a species *provisionally*. A name once published stands or falls on the original diagnosis no matter how poor or incomplete it may be. Another species is called by Dr. Shufeldt *Phasianus americanus*, but this name has been previously used by Audubon (Orn. Biog. V, p. 335, 1839). The name was proposed for a bird seen and described by J. K. Townsend; what it was it is diffi-

[1] Fossil Birds in the Marsh Collection of Yale University. By R. W. Shufeldt. Trans. Conn. Acad. Arts and Sciences, Vol. 19, pp. 1–110. February, 1915.

cult to say, but the name seems to have a status in nomenclature and hence renders Dr. Shufeldt's name invalid. We would propose as a substitute **Phasianus roberti** nom. nov. after Dr. Robert W. Shufeldt.— W. S.

White on an Expedition to the Interior of Australia.[1]— This paper treats of the scientific results of a trip, on camel back, of 1300 miles undertaken by Capt. and Mrs. White primarily for the purpose of adding to the knowledge of the avifauna of interior Australia. Their route lay north from Oodnadatta, the railroad terminus 700 miles north of Adelaide, and extended to the headwaters of the Finke and Todd Rivers. "A dry and awful country which, when the rain comes, blossoms like the rose, but in a short space of time (about eight weeks) once more subsides into its normal state of drought." Capt. White adds "The dreary aspect and the solitude of this vast country followed us like a nightmare as we travelled south." Collections in various departments were made and are treated by specialists, the narrative and the account of the birds being by Capt. White. One hundred and eighteen species and subspecies are listed, six of which have been described as new by Mr. Gregory M. Mathews in the 'Austral Avian Record.' The stomach contents of sixteen species are described by Mr. Arthur M. Lea.— W. S.

Cassinia, 1914[2]. The editor of the Delaware Valley Club's publication, Mr. Robert Thomas Moore, has brought out another exceedingly interesting number, though its appearance is somewhat delayed. While the policy of restricting the scope of 'Cassinia' to the states bordering on the Delaware is wisely continued, the character of the articles demonstrates the unlimited possibilities of intensive study in a limited area.

Dr. Spencer Trotter contributes to the series of biographical papers a discussion of 'Old Philadelphia Bird Collectors and Taxidermists' in which a disappearing type is considered from personal acquaintance with such examples as Chris. Wood, John Krider, etc. John D. Carter shows the possibilities of close observation on Delaware River birds even though only a short time each day may be available for the purpose. George Spencer Morris gives a delightful account of the Tacony Valley where his home is located and about which are centered all his early ornithological associations.

Henry Oldys has a paper on 'Individual Variety of Bird Songs' suggested by a paper by Mr. Moore in last year's issue of 'Cassinia' and Dr. Cornelius Weygandt writes of 'Summer in the Poconos' in his attractive style.

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[1] Scientific Notes on an Expedition into the Interior of Australia carried out by Capt. S. A. White, M. B. O. U., from July to October, 1913. Trans. Royal Soc., So. Australia, XXXVIII, pp. 407–474, pll. XXI–XXXIX, 1914.

[2] Cassinia: A Bird Annual. Proceedings of the Delaware Valley Ornithological Club. 1914. pp. 1–80, pll. I–V. March [= April, 1915.] Delaware Valley Ornith. Club, care Acad. Nat. Sciences, Philadelphia. Price 50 cts.

The summary of the spring migration is fuller than usual owing to a material increase in the corps of observers, and there are the 'Abstract of Proceedings,' 'Bibliography' and 'Club Notes.' Under the last appears an account of the Twenty-fifth anniversary dinner of the Club on January 7, 1915, at which 66 members and seven guests were present. The average attendance at the meetings during 1914 was approximately 24.— W. S.

Publications on Bird Protection.— Mr. E. H. Forbush's annual report[1] as state ornithologist of Massachusetts is, as usual, full of interesting facts and valuable suggestions. Among other things he shows the effect of birds in checking the ravages of the army worm, the effect of the destruction of ducks, herons and other aquatic birds on the abundance of mosquito larvæ and the prevalence of diseases transmitted by these insects. Ducks at least are known to devour mosquito larvæ in quantities. The European Starling and the havoc it causes in the orchards by pecking apples and pears and devouring cherries are also considered at length.

The Alabama Bird Day Book for 1915[2] for which the Commissioner of Game and Fish, Mr. John H. Wallace, Jr., is responsible, is as usual admirably fitted for its purpose, replete with short sketches and poems suitable for Bird Day celebrations and illustrated by some of the Mumford color plates of familiar species. Alabama stands well in the lead among the states of the Union in furthering the observance of Bird Day.— W. S.

Bird Enemies of two Beetle Pests.— The huisache (*Acacia farnesiana*) a favorite shade tree in the southwest is damaged by a longicorn beetle (*Oncideres putator*). "It is believed that the Southern Downy Woodpecker (*Dryobates pubescens*) and probably also the Texas Woodpecker (*Dryobates scalaris bairdi*) attack the larvæ. While neither of these birds has been found with larvæ, they have been observed at work on branches that contained numerous larvæ of this insect and have left empty chambers behind."[3]

A click beetle, seriously injurious to corn, oats and cotton, is reported upon by entomologists of the South Carolina Agricultural Experiment Station. They report that in both 1912 and 1913 "the elytra of this beetle were recognized in the excrement of a Nighthawk, presumably *Chordeiles virginianus*. These elytra were found to be very frequent in the excrement of this bird in a field of tasseling corn where thousands of these

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[1] Seventh Annual Report of the State Ornithologist [of Massachusetts] for the Year 1914, Sixty-second Ann. Rept. State Board of Agr., pp. 1–31. January 13, 1915.

[2] Alabama Bird Day Book. Issued by Department of Game and Fish. John H. Wallace, Jr., Commissioner; Miss Sophia Watts, Secretary. [Montgomery, Ala.]

[3] High, M. M. The huisache girdler. Bull. 184, U. S. Dept. of Agric., April 8, 1915, p. 8.

beetles had congregated." [1] Records of the Biological Survey show this beetle to be devoured by the following additional species of birds: Killdeer, Least Flycatcher, Starling, Orchard Oriole, English Sparrow, Gray-cheeked Thrush and Robin.— W. L. M.

Dissemination of the Chestnut-blight Fungus.— In 'The Auk' for January, 1915,[2] the writer reviewed a paper on birds as carriers of the chestnut-blight fungus.[3] It was then remarked that "the part birds play in the general spread of the disease is so small that it will never be seriously urged as a reason for diminishing bird protection." If further argument were needed to buttress this position, it is available in abundance in a paper by the same authors (plus one) on "Air and wind dissemination of Ascospores of the Chestnut-blight Fungus." [4]

Two paragraphs of their conclusions are quoted: "In and near badly diseased chestnut groves or forests the number of ascospores falling on each square foot of exposed surface following a period of rain, as indicated by exposure plates, is very large and is sufficient to offer abundant opportunity for new infections."

"All of these experiments point to air and wind transport of the ascospores of the chestnut-blight fungus as one of the very important methods of dissemination. . . . It can now be said with absolute certainty that following each warm rain of any amount ascospores are carried away from diseased trees in large numbers. Since they have been obtained in large numbers at distances of 300 to 400 feet from the source of supply, the conclusion of the authors that they may be carried much greater distances is justified. During dry periods wind dissemination of ascospores does not occur at all or sinks to a very insignificant minimum."

If the blight is freely distributed by so omnipresent an agency as the wind, the part that birds play in the dissemination must be reckoned as comparatively unimportant.— W. L. M.

The Ornithological Journals.[5]

Bird-Lore. XVII, No. 2. March–April, 1915.

Bird-Life in Southern Illinois. III. Larchmound: A Naturalist's Diary. By Robert Ridgway.

A Mysterious Bird of the Marsh. By Verdi Burtch.— A study of the Bittern with excellent photographs.

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[1] Conradi, A. F. & Eagerton, H. C. The spotted click beetle (Monocrepidius vespertinus Fab.). Bull. 179, Dec. 1914, p. 7.

[2] Vol. XXXII, No. 1, p. 119.

[3] Journal Agr. Research, II, No. 6, Sept., 1914, pp. 405–422.

[4] Journ. Agr. Research, III, No. 6, March, 1915, pp. 493–525.

[5] The name of the editor and publisher of each journal will be found in the January number of 'The Auk.'

Second Sectional Bird Census, 1914. Taken at Berwyn, Chester County, Pennsylvania. By F. L. Burns.— Compared with a similar census made in 1899–1901 it shows little difference in the totals which are 62 species and 1388 individuals for the earlier count, and 60 species and 1424 individuals for the 1914 census.

The Story of a Red-tailed Hawk. In Two Parts. Part II. By Mrs. A. B. Morgan.

Migration of N. A. Kinglets. By W. W. Cooke. Plumage notes by F. M. Chapman, color plate by Fuertes.

The Educational Leaflet treats of the Towhee and is by T. G. Pearson, with an excellent color plate by Fuertes. The Audubon Society Department also contains an admirably illustrated article by W. L. and Irene Finley on the Road-runner and ' Facts about Cats ' by E. H. Forbush.

Mr. Francis Harper contributes a remarkable photograph of feeding Meadowlarks to this number.

The Condor. Vol. XVII, No. 2. March–April, 1915.

Adaptability in the choice of Nesting Sites of Some Widely Spread Birds. By C. H. Kennedy.— Arkansas Kingbird nesting in open box on top of derrick, on a telephone pole and in an old Oriole's nest.

Nesting of the American Osprey at Eagle Lake, California. By M. S. Ray.

Notes on the Murrelets and Petrels. By A. Van Rossem.— Differences between *Brachyramphus hypoleucus* and *craveri* and between *Oceanodroma socorroensis* and *melania*.

Birds of a Berkley Hillside. By Amelia S. Allen.— With photographs of familiar Californian birds.

A Forty Acre Bird Census at Sacaton, Arizona. By M. F. Gilman.

Some Park County, Colorado, Bird Notes. By E. R. Warren.

The Wilson Bulletin. Vol. XXVII, No. 1. March, 1915.

June Birds of Laramie, Wyoming. By W. F. Henninger.— 105 species noted.

Birds by the Wayside, in Europe, Asia and Africa. By Althea R. Sherman.— Interesting observations on the birds of India in January in this installment.

Birds About a Country Home in Winter. By Alice Edgerton.

Comparative Periods of Deposition and Incubation of Some North American Birds. By F. L. Burns.— A compilation from manuscript notes of the author and others as well as from other sources.

The Oölogist. Vol. XXXII, No. 3. March 15, 1915.

A Nest of the Florida Red-shouldered Hawk. By Finlay Simmons.

The Rolling Call of the Pileated Woodpecker. By E. W. Vickers.— Interesting study of this bird.

List of Birds of Eastern U. S. Found in Jamaica and in Colombia in 1913. By Paul G. Howes.

Proceedings of the Nebraska Ornithologists' Union. Vol. VI, Part 2. February 27, 1915.

The Eskimo Curlew and its Disappearance. By M. H. Swenk.— A timely résumé of records with a photograph of a specimen obtained at Charles, Merrick Co., Nebraska, April 20, 1911.

The Oölogist. Vol. XXXII, No. 4. April 15, 1915.

Pileated Woodpecker. By O. Reinecke.— Near Buffalo, N. Y.

White-throated Swifts. By C. F. Schank.— Escondido, Cal.

Bulletin of the British Ornithologists' Club. No. CCIV. February 27, 1915.

Mr. Stuart Baker described (p. 61) *Laiscopus collaris whymperi*, from Garhwal, India.

The meeting was mainly devoted to a discussion of "Coloration as a Factor in Family and Generic Differentiation."

Dr. Percy R. Lowe presented the subject under six headings (1) "The distinction which must be made between colour-pattern and mere coloration"; (2) "The question of concealing coloration and vice versa, viz: brilliancy of coloration"; (3) "The constancy and persistence of colour-pattern"; (4) "The co-relation of colour-pattern with other generic characters"; (5) "Colour-pattern as a phylogenetic or generic clue"; (6) "The relation of colour-pattern to the question of 'genera-splitting' or 'genera-lumping'" (cf. Notes and News of this number of 'The Auk.')

Bulletin of the British Ornithologists' Club. No. CCV. March 29, 1915.

Dr. E. Hartert stated his opinion that *Œnanthe stapanza* and *Œ. aurita* are dimorphic forms of the same species.

Lantern slides were exhibited illustrating the faunal regions of Algeria, and the birds of the mouth of the Yenesei, N. Siberia.

The following new forms were described. By J. D. LaTouche: *Garrulus diaphorus* (p. 98), N. E. Chihli, China. By C. H. B. Grant: *Centropus grillii wahlbergi* (p. 99), Umslango, Pt. Natal; *Indicator minor alexanderi* (p. 99), Gambaga, Gold Coast; *I. exilis leona* (p. 100), Sierra Leone; *I. e. ansorgei* (p. 100), Gunnal, Portuguese Guinea, *Pogoniulus chrysoconus rhodesiæ* (p. 100), Chambesi Valley, Rhodesia, *Dendropicos fuscescens cosensi* (p. 101), Senegal; *D. lafresnayi loandæ* (p. 101), Loanda Dist.; *Thripias namaquus intermedius* (p. 101), Ugogo, German E. Africa; *Jynx ruficollis cosensi* (p. 102), Umala River, Afr.

British Birds. Vol. VIII, No. 10. March 1, 1915.

Notes on Migration at Dungeness, Kent, Autumn 1914. By H. G. Alexander.

Notes on the Habits of the Fulmar Petrel. By O. G. Pike.— With Admirable photographs.

British Birds. Vol. VIII, No. 11. April 1, 1915.

The Blakeney Point Ternery. By Wm. Rowan.— Well illustrated.

Avicultural Magazine. Vol. VI, No. 5. March, 1915.

The Kingfisher and Snipe in Captivity. By G. E. Rattigan.

My Hummingbirds and How I Obtained them. Anon.

Rare Birds in Continental Zoos. By G. Renshaw.

Avicultural Magazine. Vol. VI, No. 6. April, 1915.

A Tame Raven. By R. Phillipps.

Bird Notes and News. Vol. VI, No. 5. Spring, 1915.

On Liberating Cage Birds.

The Birds of Shetland and Orkney.

Bird Notes. Vol. VI, No. 2. February, 1915.

Nesting of the Lesser Grey-headed Guan (*Ortalis vetula*). By R. Suggitt.

British Corvidæ. By F. Dawson Smith. (Cont'd in March.)

A Journey Across the Sierras, S. California. By W. S. Baily. (Also cont'd in March issue.)

Bird Notes. Vol. VI, No. 3. March, 1915.

Birds of the Jhelum District. By H. Whistler. (Cont'd.)

The Emu. Vol. XIV, Part 3. January, 1915.

Royal A. O. U. Fourteenth Session.

Problems of Nomenclature. By A. H. E. Mattingley.— An admirable address by the president of the R. A. O. U. in which he presents a fair consideration of all sides of the question and advocates the use of trinomials and the observance of the International Code of Nomenclature.

The Mallacoota Excursion. By A. H. Chisolm.— The annual field trip of the R. A. O. U., upon which it was possible to study such interesting birds as the Emu Wrens and Satin Bower Birds "while the ringing voices of Lyre Birds floated up from the dense fern gullies with the first hint of dawn"!

The Birds of Mallacoota. By Capt. S. A. White. A well annotated list.

Australian Cuckoos. By H. L. White.— Lists of foster parents of the various species.

Notes upon *Astur cruentus* (*Urospiza fasciata cruenta*). By H. L. White.

Descriptions of New Australian Birds' Eggs. By H. L. White.

The Young of *Climacteris leucophæa*. By J. W. Mellor.

Cuckoos and their Offspring. By S. A. Hanscombe.

Cuckoos — Ejection of Foster Parents' Chicks. By A. G. Campbell.

North Queensland Birds. By D. Le Souëf.

Cuckoos in Tasmania. By Miss J. A. Fletcher.

Missing Birds. By A. J. Campbell.

Notes on Kagus (*Rhinochetus jubatus*). By H. E. Finckh.

Ornithologische Monatsberichte. (In German.) Vol. 23, No. 1. January, 1915.

Further Additions to the Avifauna of Prussian Schlesia. By Paul Kollibay.

Ornithologische Monatsberichte. Vol. 23, No. 2. February, 1915.

Remarks on *Carduelis c. carduelis* and *C. c. major*. By Dr. E. Hesse.

Two New Species from Africa. By A. Reichenow.

Falco pyrrhogaster (p. 25), Bosum, E. Cameroon; and *Dendromus aureicuspis* (p. 26), Ussagara, German E. Africa.

Berajah 1914, pp. 15–22.

Contains extensive discussion of the development of down feathers of *Falco peregrinus*.

Proceedings of the Bavarian Ornithological Society. XII, No. 2. (In German.)

Two new forms from Caucasus. By A. Laubman.— *Carpodacus erythrinus kubanensis* (p. 93), Karaul Kisha; *Emberiza cia prageri* (p. 98), Psebai, both localities in N. W. Caucasus.

Miscellanea Ornithologica. By C. E. Hellmayr.— Describes as new *Parus ater prageri* (p. 119), Jagdhaus Kischa, N. W. Caucasus; *Pipra aureola scarlatina* (p. 122), Fazenda Cayoá, São Paula, Brazil; *Urosticte benjamini rostrata* (p. 125), La Selva, W. Colombia.

A Short Contribution to the Ornithology of Espirito Santo, S. E. Brazil. By C. E. Hellmayr.— Annotated list of 56 species.

On a New Grosbeak from Venezuela. By C. E. Hellmayr and J. Graf von Seilern.— *Pheuticus chrysopeplus laubmanni* (160) Galipan, Venezuela.

Revue Francaise d'Ornithologie. VI, Nos. 64–65. August–Sept., 1914. (In French.)

Specimens of *Fregilupus varius*. By A. Menegaux.— Photograph of four specimens in the Museum of Troyes.

Song Bird Fauna in the Environs of Vendome (cont'd.). By W. E. Coursimault.— Runs through numbers 66–67 and 69.

The Forcol [= Wryneck]. By A. Boutilleri.— A monographic account (completed in No. 66–67).

The Birds of New Caledonia. By A. Menegaux.

Revue Francaise d'Ornithologie. VI, No. 66–67. October–September, 1914.

The Generic Names *Mesites*, *Mesœnas* and *Mesitornis*. By L. Brasil.— *Mesites* Geoff, 1838, antedates *Mesites* Schœnherr, 1838 (Coleoptera), and the substitute names were unnecessary.

Revue Francaise d'Ornithologie. VI, No. 68. December, 1914.

Note on the Food of the Grosbeak. By P. Paris.

Revue Francaise d'Ornithologie. VI, No. 69. January, 1915.

Ornithological Notes from French West Africa. Birds of Prey observe April 1913–May, 1914, on the Dakar Peninsula. By Dr. Millet-Horsin.

On Aepyornis. By R. Didier.

On the Uropygial Gland in Birds. By Paul Paris.

Revue Francaise d'Ornithologies. VI, No. 70. February, 1915.

The War and the Birds. By J. L'Hermitte.

Ornithological Notes from French West Africa. The Agni Legend of the Hornbill. By Dr. Millet-Horsin.

Report on a Collection of Birds Brought from India. By A. Engel (to be continued).— Eighty species are listed in this installment.

Revista Italiana d'Ornitologia. III, No. 3–4. July–December, 1914. (In Italian.)

On *Phylloscopus tristis* Blyth. By G. Vallon.

On the Necessity of International Legislation to Prohibit the Importation of Bird Plumage into Europe. By G. Whitaker.

Anomalies in the Coloration of the Plumage of Birds. By G. A. Carlotto.

On the Oriental Forms of the Genus Guttera. By A. Ghigi.— A careful monograph.

Hierophasis dissimilis. A New Mutation Form of *H. swinhoii* Gould. By A. Ghigi.— Contains much interesting information on the pedigree of these pheasants bred in captivity through several generations. The advisability of naming such forms as this is however decidedly open to question.

Ornithological Articles in Other Journals.[1]

Kellogg, V. L. A Fourth Mallophagan Species from the Hoatzin. (Science, March 5, 1915.) — The nearest allies of three of these parasites of the Hoatzin are found on shore birds and storks, while species congeneric with the fourth occur on pheasants. The data do not throw much light upon the relationship of the Hoatzin but suggest an affinity with water birds rather than with the gallinaceous group.

Swarth, H. S. Albinism in the English Sparrow (Science April 16, 1915).— To the notes on albinism in the English Sparrow, a well known condition that seems to have been just discovered by certain contributors to 'Science,' Mr. Swarth adds some really valuable data. He calls attention to the adaptation of Brewer's Blackbird (*Euphagus cyanocephalus*) to altered conditions brought about by increased settlement in southern California, and to the prevalence of albinism in this species. The House Finch (*Carpodacus mexicanus frontalis*) however, which is still more "domesticated" does not exhibit such a tendency.

Chamberlain, B. R. Marsh Hawk Breeding in South Carolina. (Bull. Charleston Mus., February, 1915.)

Tyler, John G. Allies of the Farmer. (San Joaquin Light and Power Magazine, January, February and March, 1915.) — A series of popular articles on the familiar birds of the San Joaquin Valley, Cal.

Dale, Melville. August Bird Life at Pleasant Point, Ont. (Ottawa Naturalist, March, 1915.)

Clyne, Robt. Notes on Birds Observed at the Butt of Lewis (cont'd.). (Scottish Naturalist, April, 1915.)

Maxwell, Herbert. Waterfowl and the American Pond Weed (*Elodea canadensis*). (do.) — Proves an attractive food plant.

Dewar, J. M. The Sense of Direction. (Zoölogist, February 15, 1915.) — The two theories (1) knowledge of landmarks, (2) sensing position "in terms of bodily displacements in space experienced on the outward journey" are outlined. A number of observations are given which show that the latter is a more satisfactory hypothesis than the former.

Blake, J. Notes on the Birds around Cardiff. (do.)

Selous, E. Ornithological Observations in Iceland, June and July, 1912. (do.)

Patten, C. J. Aquatic Warbler on Migration Obtained on Tuskar

[1] Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Rock: With Special Reference to the Plumage Markings as Compared with those of the Sage Warbler. (do. March 15, 1915.)

Patterson, H. H. Ornithological War-Notes from Great Yarmouth. (do.)

Finley, W. L. The Bob-White in Oregon. (Oregon Sportsman, February, 1915.)

Froggatt, W. W. Bird Notes (Australian Zoologist, Vol I, Part 2.)— Numerous notes on Australian species.

Dabbene, R. A New Bird for Argentina.— *Manacus manacus gutturosus* (Desm.). (Bolet. Soc. Physis, Buenos Aires I, No. 7, December 31, 1914.)

Hirtz, Dr. M. Critical Remarks on Madarasz's Birds of Hungary. (Glasnik hrvatskoga Prerodoslovnoga Denstia, XXVI, No. 4.)

Keartland, G. A. On the Specific Name of the Blood-stained Cochatoo, *Cacatua sanguinea* Gould. (Victorian Nat., March, 1915.) — *C. sanguinea* and *C. gymnopis* considered to be identical.

Kershaw, J. A. A Naturalist in Northern Queensland. (Victorian Nat., March, 1915.)

Rothschild, W. and **Hartert,** E. The Birds of Dampier Island. (Novit. Zool., XXII, No. 1, February 12, 1915) and The Birds of Vulcan Island (do.) — These two islands lie off the northwestern coast of New Guinea; 49 species are listed from the former and 41 from the latter. *Macropygia rufa krakari* (p. 28), Dampier Isl.; *Hypocharmosyna rubrigularis krakeri* (p. 31), Dampier Isl.; *Macropygia amboinensis meeki* (p. 39), Vulcan Isl.; *Tanysiptera hydrocharis vulcani* (p. 42), Vulcan Isl. and *Monarcha chalybeocephalus manumudari* (p. 43), Vulcan Isl. are described as new.

Rothschild, W. and **Hartert,** E. Notes on Papuan Birds (continued). (Novit. Zool., XXII, No. 1, February 12, 1915.) — *Accipiter fasciatus polycryptus* (p. 53). 'Sogeri dist.' N. Guinea; *Colluricincla brunnea tachycrypta* (p. 60), Milne Bay, N. Guinea, subsp. nov.

Hartert, E. In Algeria, 1914. A Journey to the M'Zab Country and Over the Central High Plateaus. (Novit. Zool., XXII, No. 1, February 12, 1915.) — An interesting account of a trip through this desert country and the rediscovery of several species — *Garrulus minor* Verr., *Chersophilus duponti* (Vaill), etc.

Rothschild, W. On the Genus Fregata. (Novit. Zool., XXII, No. 1, February 12, 1915.) — While Mathews arrangement of the forms (Austral Av. Rec., II, No. 6) is for the most part endorsed, the fact it pointed out that *Fregata minor* belongs to the bird of the East Indian Ocean, also that the large Galapagos bird is the same as that of the West Indies and being distinct from *F. minor*, this form should be known as *F. magnificens* Math.

Publications Received.[1] — **Cory,** Charles B. Descriptions of New Birds from South America and Adjacent Islands. (Publ. 182, Field Mus. Nat. Hist., Ornith. Series, Vol. I, No. 8, pp. 293–302, February 23, 1915.)

[1] Owing to the early compilation of Recent Literature for this number, only publications received prior to April 15 are included.— Ed.

Forbush, E. H. Seventh Annual Report of the State Ornithologist of Mass. (Sixty-second Ann. Rept. State Board Agr., pp. 1–29, repaged January 13, 1915.)

Grinnell, Joseph. Conserve the Collector. (Science, February 12, 1915, repaged, pp. 1–4.)

Grinnell, Joseph and **Bryant,** H. C. The Wood Duck in California. (Cal. Fish and Game, I, No. 2, repaged, January 30, 1915.)

Levick, G. Murray. Antarctic Penguins. A Study of their Social Habits by Dr. G. Murray Levick R. N., Zoologist to the British Antarctic Expedition [1910–1913]. New York, McBride, Nast & Company, 1914. Small 8vo. pp. 1–140, figs. 1–74. Price, 1.50 net.

Miller, W. DeW. Notes on Ptilosis, with Special Reference to the Feathering of the Wing. (Bull. Amer. Mus. Nat. Hist., XXXIV, Art. VI, pp. 129–140, March 19, 1915.)

Shufeldt, R. W. (1) Fossil Birds in the Marsh Collection of Yale University. (Trans. Conn. Acad. Arts. and Sci., Vol. 9, pp. 1–110, February, 1915.) (2) Contribution to the study of the "Tree Ducks" of the genus Dendrocygna. (Zoöl. Jarbüch., pp. 1–70, with 16 plates. 1914.) (3) Review of the Wild Geese of North America, Part II. (Outer's Book, March, 1915.) (4) Eggs of North American Water Birds (Introduction). (Blue Bird, March, 1915.)

Stephens, Frank. Arid California and its Animal Life. (Cal. Fish and Game Com. Report, 1914, repaged, pp. 1–8.)

Swarth, H. S. The Status of the Arizona Spotted Owl. (Condor, XVII, January 20, 1915, pp. 15–19.)

Tyler, John G. Allies of the Farmer (San Joaquin Light and Power Magazine, III, Nos. 1–3, January–March, 1915.)

Wallace, John H., Jr. Alabama Bird Day Book. 8vo. pp. 1–96, numerous plates. Dept. of Game and Fish, Montgomery, Ala.

White, S. A. Scientific Notes on an Expedition into the Interior of Australia carried out by Capt. S. A. White, M. B. O. U., from July to October, 1913. (Trans. Royal Soc. South Australia, Vol. XXXVIII, 1914, pp. 407–474, pls. XXI–XXXIX.)

Abstract Proc. Zool. Soc. London, Nos. 139–141.

American Museum Journal, The, XV, No. 3, March, 1915.

Australian Zoologist, The, Vol. I, Part 2, February 22, 1915.

Avicultural Magazine, (3) VI, 5–6, March–April, 1915.

Bird-Lore, XVII, No. 2, March–April, 1915.

Bird Notes and News, VI, No. 5, Spring, 1915.

British Birds, VIII, Nos. 10–11, March–April, 1915.

Bulletin British Ornith. Club, Nos. CCIV–CCV, February 27 and March 29, 1915.

Bulletin of the Charleston Museum, XI, Nos. 2 and 3, February–March, 1915.

Bulletin Univ. State of N. Y., No. 11, Bird Day circular, 1915. [Broadside.]

Cassinia, Proceedings of the Delaware Valley Ornithological Club, No. XVIII, 1914, pp. 1–80, pls. I–V. (Issued March [= April 17], 1915.)

Condor, The, XVII, No. 2, March–April, 1915.

Emu, The, XIV, Part 3, January, 1915.

Forest and Stream, LXXXIV, Nos. 3 and 4, March–April, 1915.

Oölogist, The, XXXII, Nos. 3, 4, March and April, 1915.

Oregon Sportsman, The, III, No. 2, February, 1915.

Ottawa Naturalist, The, XXVIII, Nos. 11, 12, February and March, 1915.

Proceedings Cal. Acad. Sci., IV, Nos. 4–5; V, Nos. 1–2, March 14 and 26, 1915.

Proceedings National Acad. Sci., I, No. 3, March, 1915.

Revue Francaise d'Ornithologie, VI, Nos. 64–65, 66–67, 68. September, November and December, 1914; VII, Nos. 69, 70, January and February, 1915.

Revista Italiana di Ornitologia, III, No. 3–4, July–December, 1914.

Science, N. S., XLI, Nos. 1056–1061.

Scottish Naturalist, The, Nos. 39, 40, March and April, 1915.

Verhandlungen der Ornith. Gesell. in Bayern. XII, Heft. 2, February 8, 1915.

Wilson Bulletin, The, XXVII, No. 1, March, 1915.

Zoologist, The, XIX, Nos. 218 and 219, February and March, 1915.

NOTES AND NEWS.

Harry Kirkland Pomeroy, an associate member of the American Ornithologists' Union, died of Typhoid Fever in Kalamazoo, Mich., on January 27, 1915.

Mr. Pomeroy was born in Lockport, New York, April 3, 1865, and moved to Kalamazoo, Mich., in 1872. His favorite study was Ornithology and his collection of birds' nests and eggs is one of the best in the State.

The many friends who enjoyed the privilege of Mr. Pomeroy's acquaintance will learn with deep regret of his untimely death. His kindly considerate nature and earnest helpfulness to his friends were among the many sterling characteristics that helped to endear him and make him beloved by them all.

Mr. Pomeroy was an active member of the Cooper Ornithological Club and deeply interested in western ornithology and oölogy. His excellent collection is an enduring monument to his industrious habits and studies during the leisure hours snatched from a busy outdoor life.— E. Arnold.

We learn with great regret of the death of Lord Brabourne, who was killed in action on March 13, 1915, in the twenty-ninth year of his age. He had returned only recently from South America where he was collecting material for the work on 'The Birds of South America' which he was writing in conjunction with Mr. Charles Chubb and of which only one part had appeared. Lord Brabourne was an officer of the Grenadier Guards.

The question of the limits of genera bids fair to be the most serious problem in zoölogical nomenclature. In the recent 'List of British Birds' there are 171 species and 151 generic groups which are to be found also in the A. O. U. Check-List. The two committees working under the International Code have, after making allowance for several admitted errors or arbitrary violations of rules, arrived at the same names for all but four of the species, while the latest British list differs from that of Dr. Hartert and his associates in only 3 specific cases. When three independent committees approach so close to uniformity it would seem that the International Code had solved the problems of nomenclatural discrepancy.

In the case of the 151 genera, however, we find 49 cases where the names employed are different. After making allowance as above we find that only 7 of this number are due to questions of nomenclature, i. e. to the still unsettled point as to how much difference in spelling constitutes a different word and to the recognition of certain works in systematic nomenclature.

The other 42 cases are due to difference of opinion as to the limitation of genera. One committee, for instance, considers that the Mallard, Blue-winged and Green-winged Teal, each represents a distinct genus and consequently calls them *Anas brachyrhynchos, Querquedula discors* and *Nettion carolinense*. Another considers that they all belong to one genus and quotes them as, *Anas brachyrhynchos, Anas discors* and *Anas carolinensis*. The third regards the Teal as congeneric but considers that the Mallard represents a distinct genus and we have, *Anas brachyrhynchos Querquedula discors* and *Querquedula carolinensis*. It will be noticed that there is here just as much confusion and difference of opinion as could possibly be occasioned by the law of priority, the 'first species' rule of type fixation, or any of the other principles of nomenclature against which such protests have been directed; and yet this is due purely to a question of ornithology with which the rules of nomenclature and the "name jugglers" have nothing whatever to do.

Now if the name of a bird is to be used as a medium to exploit personal opinions as to the phylogeny and relationship of species we had better devise some other means of tagging a species so that some one else will know what we are talking about.

If on the other hand the name of the bird is to constitute such a 'tag' then we should by some international and arbitrary agreement decide these disputed cases so that we may have the same uniformity *ornithologically* that we seem to have at last attained *nomenclaturally*.

The great majority of ornithologists are pretty well agreed upon the great

majority of genera and there will not be so very many to be settled arbitrarily, but such arbitrary action, if we are to have a permanent and universal system of names, seems to be inevitable. Those who wish to make further subdivisions may still use the suppressed names as subgenera in any discussion or systematic monograph.

Another phase of the same question is the increasing tendency to recognize finer and finer generic divisions, a matter which has been discussed by the writer (Jour. Acad. Nat. Sci. Phila. XV, p. 313) and by the British Ornithologists' Club at a recent meeting (Bull. B. O. C., No. CCIV, p. 68 et seq.). In some groups we have already reached the stage where a large number of genera contain but a single species each. The generic name has thus become of exactly the same significance as the specific name and is superfluous. The ultimate outcome of this sort of thing will be a nomenclature wherein each species will have a name but no clue whatever to its relationship will be found in this name.

Linnæus' idea was that the 63 genera under which he arranged all the birds known to him, represented 63 types of bird structure and when the generic name was mentioned the general character of the bird was immediately known, while the specific name indicated a form of that type of bird.

Of course we cannot go back to Linnæus or anywhere near to him, but we *must*, if a name is to be maintained *as a name*, check the further subdivision of genera. Moreover why is the discovery of a slight structural difference of such paramount importance that we should overturn our names to advertise it? Is it not just as important to emphasize relationship as divergence? Indeed we are suffering at the present time in systematic ornithology for the need of some way to indicate relationship. We shall soon be forced to erect a lot of subfamilies to indicate relationships formerly denoted by generic names which have now been degraded until they are perilously close to species.

It should be born in mind that a genus is not a definite thing in the sense that a species is; it is simply a group for convenience, sometimes it is sharply defined, more often it is not. This fact is well shown in the virtual agreement of the committees referred to above as to the number of species before them and their wide differences of opinion as to the number of genera.

It is difficult to provide a means for bringing about the desired uniformity in the limits and number of generic groups, but the necessity for such action should be strongly emphasized and widely proclaimed.

THE thirty-third stated Meeting of the American Ornithologists' Union was held in San Francisco, May 17–20, 1915. This was the first regular meeting of the Union to be held outside of the eastern cities of New York, Cambridge, Washington and Philadelphia and much credit is due to the energy and generous hospitality of the California members, which were responsible not only for the notable success of the meeting, but for its being held so far away from what might be called the 'type locality' of the A. O. U.

The eastern members who formed the regular A. O. U. excursion party comprised Messrs. John H. Sage, J. H. Fleming, and Samuel Wright; Drs. T. S. Palmer and Witmer Stone and Miss May T. Cooke. Mrs. Palmer, Mrs. Wright, Mrs. Stone and Miss Haskell were also in the party. At Chicago, Mr. W. H. Osgood entertained the party at dinner. A stop of two days was made at the Grand Cañon, Arizona, and a combined list of the birds observed in the forest around the rim of the Cañon and during the descent to the bottom, was made by the members which will appear in a subsequent number of 'The Auk.'

At Los Angeles Dr. A. K. Fisher and Dr. and Mrs. J. Dwight, Jr., who had gone on ahead, joined the party, and a number of other eastern members and their families went direct to San Francisco by other routes: these included Dr. and Mrs. C. Hart Merriam, Mr. and Mrs. Otto Widmann, Mr. and Mrs. Robert C. Murphy, John T. Nichols, T. Gilbert Pearson, Dr. W. J. Holland and Mr. and Mrs. Chas. A. Schoffner.

The members who stopped over at Los Angeles were most cordially entertained by the southern division of the Cooper Ornithological Club. A reception was tendered them at the Museum of Science and Arts, where Messrs. Daggett and Swarth exhibited the collections, while Mr. and Mrs. J. Eugene Law personally conducted the trips to Catalina Island and Mt. Lowe. Messrs. A. B. Howell, W. Lee Chambers, A. E. Colburn, E. J. Brown, and others did all in their power to make the visit enjoyable.

At San Francisco the business session was held at the California Academy of Sciences and, at various times during the stay of the eastern members, Dr. Evermann and Mr. Loomis acted as hosts to those who desired to consult the valuable collections of the Academy, especially the series of Tubinares.

The Museum of Vertebrate Zoölogy of the University of California was also a center of interest to the visitors, and Drs. Joseph Grinnell and H. C. Bryant, Messrs. Tracy Storer, W. P. Taylor and others devoted much time to explaining and displaying the wonderfully complete west coast collections which have been brought together at the Museum.

The public sessions of the Union were held in halls within the grounds of the Panama Pacific International Exposition and were well attended. President Fisher, Vice-President Stone and Mr. Joseph Mailliard, President of the northern division of the Cooper Ornithological Club, presided at the sessions.

The motion pictures of Grebes, Gulls, Murres and Golden Eagles exhibited by Mr. W. L. Finley were the most notable feature of an interesting program. The annual dinner of the Union and the luncheons, one of which was held at a Chinese restaurant, within the grounds, were enjoyable affairs and thanks to the efficient management of Mr. Joseph Mailliard and his committee of arrangements, the meeting will be remembered by those in attendance as one of the most successful in the history of the Union.

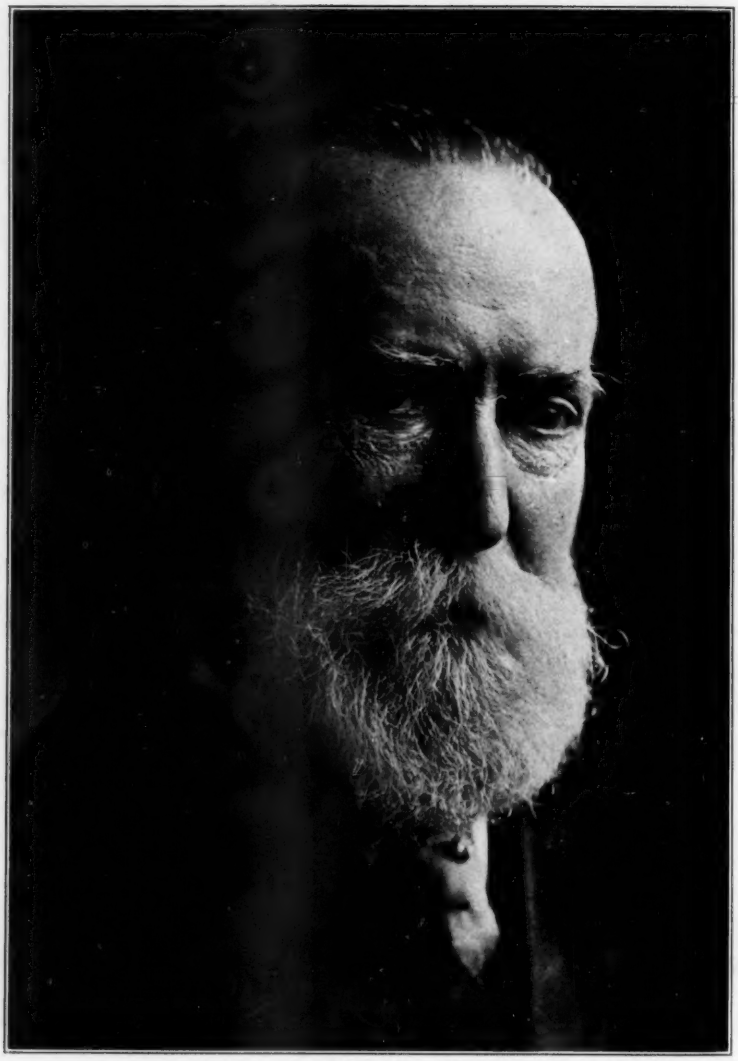
Rainy weather prevented the trip to Mt. Tamalpais on the last day of

the meeting and extremely rough water on the next day necessitated the cancelling of the Farallon trip. Dr. Evermann, however, arranged to have the Albatross cruise around the bay and a large party of A. O. U. members and friends enjoyed the trip, while others visited Mt. Tamalpais and the Muir woods. The eastern members then scattered to visit the Exposition and various parts of California, many of them being entertained by Dr. and Mrs. C. Hart Merriam at their summer home at Lagunitas.

The regular detailed account of the meeting, which could not be prepared in time for this issue, will appear in the October 'Auk.'

At the business session the proposed changes in the By-Laws whereby Members will hereafter share with Fellows the business of the Union and the election of Officers, Members, and Associates, were finally adopted.

The present officers were re-elected and Philadelphia was selected as the place of meeting in 1916, the time being left to the local committee. It was the expressed wish of all the eastern members in attendance that a large delegation from 'the coast' might be present on this occasion so that an opportunity might be provided for repaying, in part at least, the generous hospitality of California and the Cooper Ornithological Club.



Photograph by Harris & Ewing, Washington, D. C.

Yours truly
Theo Gill